Coal Age

OCTOBER, 1957

A McGRAW-HILL PUBLICATION—PRICE $1

Merger Story

Lehigh Coal & Navigation and Weston Dodson companies merge for harder sales punch . . . . . p 70

Compass No. 3

New deep mine gets high tons per man and achieves quality in modern surface plant . . . . . p 76

Sidewall Drilling

New dry-type horizontal unit drills deep holes without changing drill sections . . . . . p 98

Closed Circuit TV in Hoisting . . . p 90

NEW M-S-A® PERMISSIBLE MINE LIGHTING SYSTEMS PROMISE GREATER PRODUCTIVITY AND FEWER ACCIDENTS FOR MINES

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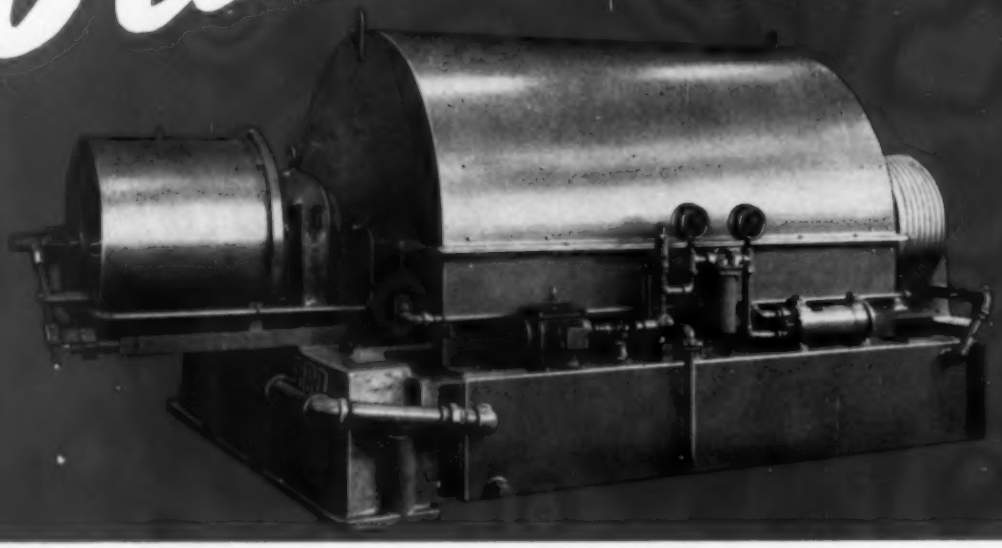

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This Month in Coal Age

OCTOBER 1957

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►Management

The Lehigh Navigation-Dodson Story .... p 70

W. A. Raleigh, Jr. Assistant Editor, *Coal Age*

The merger of Lehigh Navigation Coal Sales and Weston Dodson companies, Oct. 1, has brought together 237 yr of production and marketing experience. During the past 137 yr, Lehigh Coal & Navigation has risen to position as the largest anthracite and bituminous mining and selling concern and as one of America's most progressive, diversified business enterprises. During the past 100 yr, Weston Dodson became one of the top five anthracite independents and an important merchandiser of bituminous. Both firms are rich in the traditions and development of Eastern Pennsylvania's southern anthracite fields and share a spiritual kinship in sound business philosophy and coal merchandising practices. Their merger creates a sales force able to cope more effectively than ever with the toughest competition inside and outside the industry.

Along the Way—Six guideposts of good management; photos and biographical data on the new company's key officials.

►Deep Mining, Preparation

Complete Preparation, High Capacity Mining Highlight Compass No. 3 Mine p 76

A. E. Flowers, Associate Editor, *Coal Age*

Average output with 13-man crew is 600 tons per shift in hard Pittsburgh seam. Off-track mining equipment is concentrated in two entries. Each entry has 14 headings which are developed by two mining units. A 1,000-ton silo provides even flow of coal to preparation plant that includes sand-flotation washing of coarse coal, wet tabling of fines, mechanical and thermal drying and water clarification.

Sidelights—Results with new-type centrifugal drier; shuttle-belt railroad car loading; transmission of 12,460-v power underground.

►Equipment Inspection (Part 1)

Inspection Guide for Deep Mine Equipment ..... p 84

Daniel Jackson Jr., Assistant Editor, *Coal Age*

Inspecting equipment at scheduled periods, what to look for and how to go about the inspections are the themes of the first article in a series of three. Preventing breakdowns and reducing maintenance costs are the results of good inspecting and reporting. Part one deals with substations, both rectifiers and rotating equipment, feeder systems, and section loading points. Electrical, mechanical and lubrications inspections are covered on each equipment item.

Sidelights—Photos illustrating good practice. Chart and table to help calculate positive and negative feeder size.

►Industrial Television

Closed Circuit Television ..... p 90

Hoist operator at Mine No. 17, Peabody Coal Co., Pana, Ill., watches dumping of the coal skip from his position at the hoist controls. Formerly, an attendant was required at the dumping point to remove large lumps that might become wedged in the skip and to otherwise keep the hoisting operation running smoothly. The television equipment features drawer-type con-

(Continued on p 7)

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struction and plug-in subassemblies for easier maintenance.

Specials—Layout views of the TV equipment and installation.

► Shop Practice

Dual-Purpose Unit Tests Motors and Serves as a Welder . . . . . *p 92*

The electrical engineer of Guyan Eagle Coal Co. built a unit to test repaired and rebuilt motors before they are placed in service. Design features permit applying load tests up to 250% of rating, checking the RPM of the motor, testing motor bearings under load and conducting heat test. It can be adapted to receive AC and DC motors whose speeds are approximately 1,800 rpm with horsepowers ranging from 5 to 20. The benefits from such a test unit are fewer breakdowns and reduced maintenance and repair cost.

Added Feature—How it can be used as a welder for the shop.

► Preparation

New Fine-Coal Jig Cleans ¼x0 . . . . . *p 94*

Fine-coal jig, developed by E. H. Citron, preparation engineer of Pittsburg & Midway Coal Mining Co., employs bed material taken from the regular plant circuit, making it unnecessary to use feldspar or other artificial bed material. Two of the units in use at the company's DeKoven mine, Sturgis, Ky., each process 25 tph of feed containing 25.23% ash to produce clean coal containing 8.05% ash (as received). Cell size of the DeKoven units is 24x36 in.

Added Features—Operating data and application of the jigs at DeKoven; flowsheet of coal-cleaning circuits at DeKoven.

► Transportation

How to Reduce Haulage Wrecks . . . . . *p 96*

Officials of Guyan Eagle Coal Co., Amherstdale, W. Va., designed their own rerailing equipment for use on underground haulage roads to automatically put derailed cars back on the track. The rerailers are permanently installed at intervals, even where fast haulage is the rule. Greater safety and lower costs are obvious advantages. Guyan-Eagle has special designs applicable to different haulage speeds.

Feature—Step-by-step details on how to make and install the rerailers.

(*Continued on p 11*)

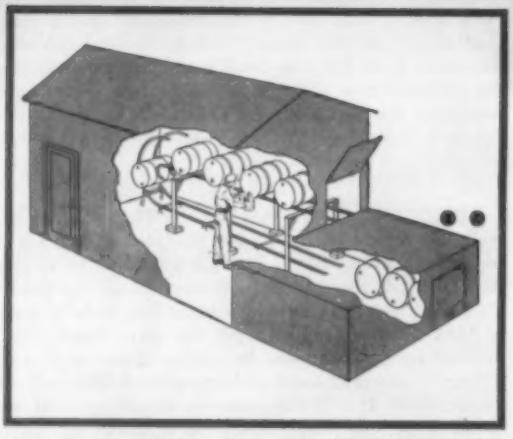
This Month in Coal

NO SURPRISES—After going into October with a modest production margin over 1956, the bituminous industry can look forward to finishing the year with no sudden dips, upsurges or other surprises. This reflects the picture in business and industry, which is one of either an even keel or a moderately rising tendency. Steel, for example, probably will operate at an 85 to 90% rate in the last quarter, or the same as in 1956. Automobile production, however, is expected to rise in the last quarter, and if it showed enough of an upsurge could carry the steel rate up with it. One bugbear is inventory accumulation, in which coal also is involved. Stocks now are much higher than for the same period in 1956. A weighing of factors, however, indicates that earlier forecasts of an increase of 5 million tons—perhaps more—are still valid, as are forecasts that anthracite has a good chance of coming close to its 1956, tonnage with only a modest weather break.

NOT IN 1957—Old campaigners would be first to say that nothing is certain as far as John L. Lewis is concerned, but there remains no visible evidence that a request for another wage increase will come in the remainder of 1957, in spite of published speculation and qualified prognostications. Though the market climate has never been the sole deciding factor with Mr. Lewis, the one that now prevails, while not the worst, is quite definitely not the best. As another forecast to add to the pot, consider this: Not in 1957—and maybe not in 1958.

CONGRESS PAST AND FUTURE—Handicaps as well as benefits for coal were included in actions taken in the first session of the 85th Congress, which adjourned Aug. 27. On the handicap side—at least eventually—Congress, after giving every indication that it intended to beat down attemps to put the government into the nuclear-power business in competition with private industry, reversed itself and approved a foot-in-the-door compromise. It failed to pass the nautral-gas bill, which, in view of its provisions, was opposed by the coal industry, but the bill will be back for the second session. Two bills to implement the finidings of the House Coal Research Subcommittee, including raising the coal depletion rate to 27½%, were offered and will hold their place on the schedule for the second sessions. Nothing was done on controlling the flood of residual fuel, though a Senate subcommittee recommended that the Department of Justice look into the situation from the antitrust angle. Picture in the second session? Probably one of relatively little action affecting coal, and that little probably about 50:50 for and against.

TURBINE PROGRESS—The wait has been long, but the road-test phase of the gas-turbine locomotive development program now is not too far off. The big bugaboo of turbine-blade erosion has now been licked and the end of a 1,000-hr test period was close at hand at the end of August, with no plugging in the ash-handling system. The scheduled next step is building of the first locomotive for road-testing.



This type of oil storage house simplifies the handling problem. Filled drums are moved directly from the loading platform to the light gage mine rails above; empty drums are rolled onto lower rails and stored under the loading platform. Storage house should be of fireproof construction and kept clean at all times.

. . . starting point

Lubrication is an important item in your mine's operating budget. That's why you should give oils and greases the same special storage and handling care you give renewal parts.

A central storage house of the type shown here can help you prevent waste and contamination . . . protect lubricants from water, dust, dirt and other foreign matter. Moreover, it simplifies handling because it eliminates the need for expensive hoisting equipment and lifting from one level to another.

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for lower tonnage costs

Your Texaco Lubrication Engineer can help you set up the most efficient system for your mine. He has had experience with central, outside and underground storage and handling systems.

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For wire ropes and open gears, use *Texaco Crater* or *Texaco Crater X Fluid*. Both keep wire rope strong longer... give gears smoother operation and longer life.

Your Texaco Lubrication Engineer has had special training in mine equipment lubrication. To contact him, just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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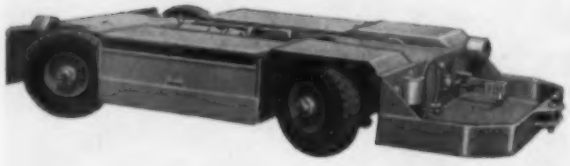
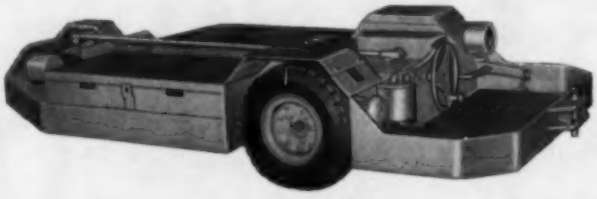
HOW you get greater payload at less cost . . .



NEW — Model 744

Under normal conditions this tractor is capable of hauling a 20-ton payload!



Model HT-8

Specially designed for use in operation where bottom conditions are normal — this rubber-tired tractor vs. rail will earn 75 cents more per ton!

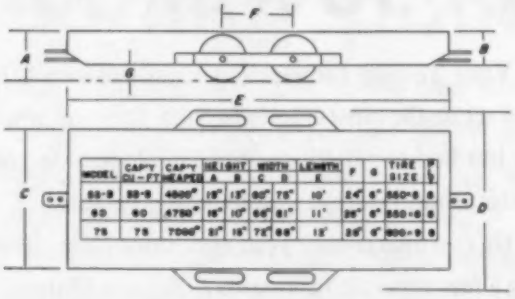
HOW you can choose cars to fit size of mine

Model 60, 2-ton car — for coal seams under 30" high

Model 55-B, 2-ton car — for coal seams 30" and higher

New Model 75, 3½- ton car — for higher capacity mines

Patent No. 2,793,603
For Tandem Coal Car



MODEL	CAP'Y CU.-FT.	CAP'Y HEAPED	HEIGHT A	HEIGHT B	WIDTH C	WIDTH D	LENGTH E	F	G	TIRE SIZE	W LBS.
55-B	55-B	4000#	28"	13"	60"	75"	10'	24"	6"	550×8	8
90	90	6750#	15"	10"	66"	81"	11'	25"	6"	550×8	8
75	75	7000#	21"	15"	72"	88"	12'	26"	6"	900×9	9

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designs and builds a complete line of mine haulage equipment including — tractors, rail-locomotives, tandem coal and supply cars, battery charging equipment and a complete stock of batteries.

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This Month in Coal Age

CONTINUED

Overburden Drilling

New Horizontal Overburden Drill Increases Stripping Efficiency ..... p 98

Development of a new horizontal rotary dry-type drill with a single drill stem, 60 ft long, permits a 9-in hole to be bored 48 ft deep without adding drill sections. The new drill consists of a crawler-mounted steel frame, operator's cab, hydraulic leveling jacks, drill-stem boom, hydraulic system, air compressor and power transformers. The one-man operation works one full and one part shift six days a week and drills enough holes for round-the-clock shovel operation, seven days a week.

Sidelights—Photos of the drill in action.

Editorials ..... p 69

Mine-to-market transportation costs—Chemicals from coal—Maintenance man of the year

Coal Commentator ..... p 12

Hydraulic possibility—Shale oil—Briquetting future—New Koehler—Five or less

Foremen's Forum ..... p 102

Report writing for supervisors—More power in words.

Operating Ideas ..... p 106

Mobile substation designed for rugged terrain—Automatic feed flow control improves filter performance—Testing device for loader assemblies

Equipment News ..... p 110

BCR designs a new bin-discharge device which handles wet fine coal; Chevrolet introduces 1958 truck models; Allis-Chalmers shows weather-tight vertical motors; Denver Equipment Co. offers a compact full-stream sampler; and Johnson-March comes out with a protective spray for storage piles. Also in this issue, a list of free bulletins offered by manufacturers to aid you in making the best possible equipment purchases.

News Roundup ..... p 126

Pocahontas Steamship Co. plans a giant collier capable of hauling 24,000 tons and featuring self-unloading equipment; Exporters see record overseas market for U. S. coal this year; India will try USBM carbonization methods on lignite; Critics score government fuel-buying policies; 1,200 mines now enrolled in national campaign to prevent roof-fall accidents.

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Coal Commentator

Hydraulic Possibility

Hydraulic mining and transportation of coal may or may not become a reality, but the way it is done in vertical seams at the Bonanza (Utah) mines of the American Gilsonite Co. is fascinating in its simplicity. Jet cars with twin booms use water at 2,000 psi to side-shear and then mine 12-ft benches, working down the pitch.

One major reason for regarding the operation with respect is the high output per unit. Gilsonite is somewhat softer than coal but even at that 330 tons per unit, with a crew of two men, is good production. And in addition to hydraulic mining and hoisting, the Gilsonite, after reduction to 8 mesh, is being pumped through a 6-in line 72 mi over mountains without a single hitch.

To repeat, hydraulic mining may or may not become a coal method, but the Gilsonite system might have some possibilities for coal, flat vein as well as pitching.

Shale Oil

Oil shale and coal are the leading contenders to replace petroleum as a source of liquid fuels. Coal, in addition, has the possibility of substituting for natural gas in the not-too-distant future when scarcity and rising costs create a climate making competition possible.

Complete coal conversion reverted to the laboratory status with the expiration of the Synthetic Liquid Fuels Act and the closing of the Louisiana (Mo.) pilot plant. The government oil-shale mine and plant at Rifle, Colo., also went out of business at the same time, but this did not end active pilot-plant work. The Union Oil Co., with a plant near Rifle, is reported to have gone up to the $7½ million mark in its oil-shale work, and the Oil Shale Corp. so far has spent $½ million investigating a Swedish process.

The end of 1957, when the Union Oil Co. pilot-plant operation is scheduled to end, should tell part of the tale. At that time it should be fairly clear whether shale oil will be competitive costwise with liquid fuels from petroleum. If so, a new industry probably will appear in western Colorado.

Would it mean additional competition for coal? Possibly, particularly in the West, but generally no more than petroleum is now or will be.

Briquetting Future

Briquetting, or the business of making big pieces of stuff out of smaller by pressure with or without a binder, is a growing activity—except for coal. This was one of the conclusions definitely to be drawn from the proceedings of the 5th biennial conference of the International Briquetting Association, summarized in the news section of this issue.

Even though the tonnage was over 1½ million in 1956, coal briquetting has declined steadily since World War II, and further drops are expected in the future. **But does this mean that coal is through as an ingredient in bigger products made out of smaller? Quite likely not, as the conference brought out.** If, for example, you want to combine the fuel with the product to be processed, coal, coke or coal char are logical ingredients. **Smelting, gas-making and chemical processing are among the briquetting, pelletizing and agglomerating possibilities, and the coal potential is impressive.**

New Koehler

Some idea of the differences between mining today and some years ago can be obtained from some of the rebuilding jobs now going on. An example is the Koehler operation of the Kaiser Steel Corp. in New Mexico.

As your commentator can testify, on the basis of visits over more than two decades, the Koehler operation, under its previous owners, had always kept abreast of the times. **Now, Koehler mine is entering still another production phase—a phase in which continuous machines will bring new highs in performance.** That is one difference, but there are many others. When the face-lifting operation is over, Koehler will join the list of modern low-cost properties in the business of turning out coal for the steel industry.

All this, as can easily be imagined, takes money—considerable money, in fact. But Koehler rebuilt will be an additional example of the value of such expenditures in cost, and in quality.

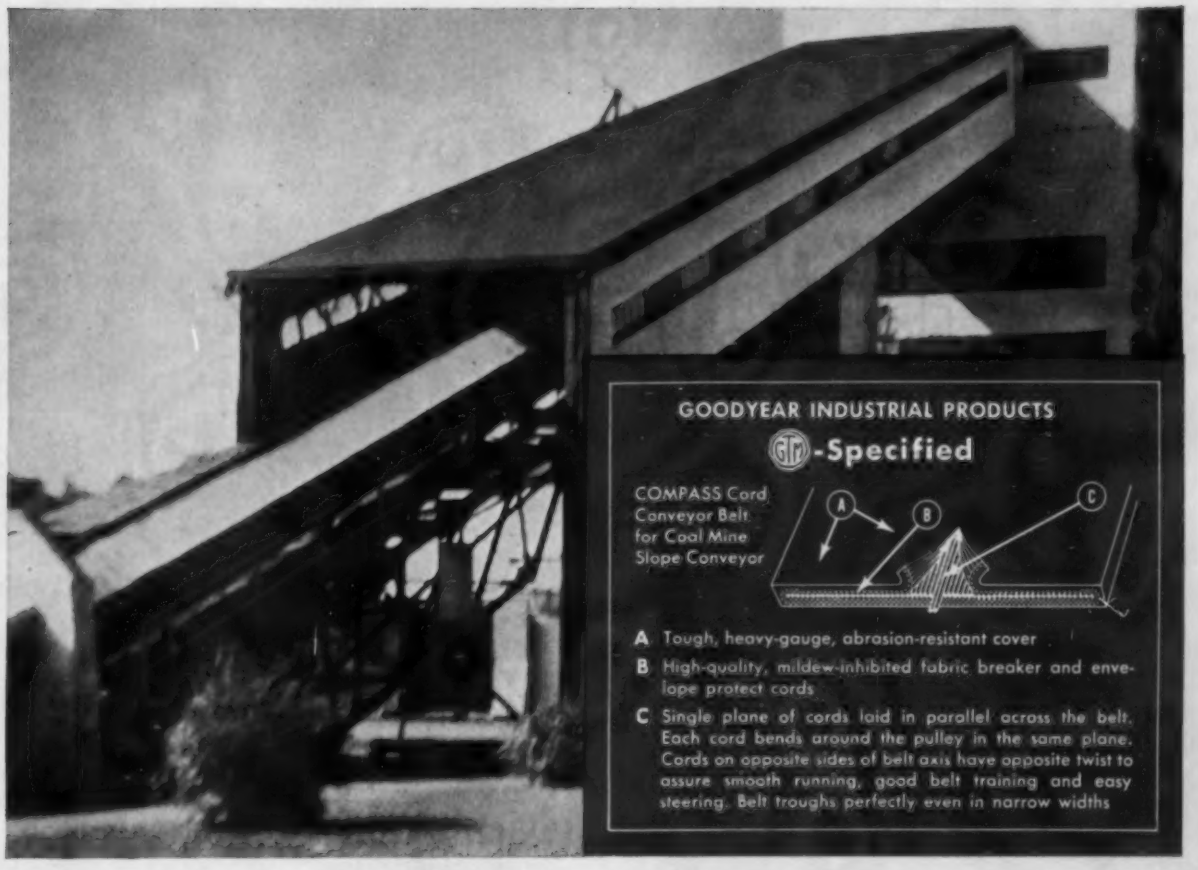
Five or Less

Bulletin F is what the income-tax collector pulls out and uses as his authority whenever the question of the life of a piece of equipment comes up—whether in coal or in any other industry. It consequently is the income-tax bible on depreciation.

Never more than a rough approximation, regardless of claims that might be made for it, it has become even rougher as the years have gone by. This is implicit in the announcement of the Bureau of Internal Revenue that it is now revising Bulletin F to make the depreciation rates therein more realistic.

The problem is complicated by the fact that useful lives vary all over the lot in coal mining. A haulage locomotive or strip shovel can easily last 20 yr or longer and still do the work for which it was designed with no more than normal maintenance. A loading machine or truck, however, can be pretty well shot in 5 yr, aside from the fact that new models may make it not worth while to run them longer in any event.

The fact that loaders, trucks and similar equipment take the lion's share of the money spent for production equipment is evidence that wear and obsolescence result in a relatively short useful life. For many such items, 5 yr is a good basis for writing them off. Sometimes it might even be less.


GOODYEAR INDUSTRIAL PRODUCTS
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COMPASS Cord Conveyor Belt for Coal Mine Slope Conveyor
A
B
C
A Tough, heavy-gauge, abrasion-resistant cover
B High-quality, mildew-inhibited fabric breaker and envelope protect cords
C Single plane of cords laid in parallel across the belt. Each cord bends around the pulley in the same plane. Cords on opposite sides of belt axis have opposite twist to assure smooth running, good belt training and easy steering. Belt troughs perfectly even in narrow widths

Serves over 12 years, sells 2 more belts

They were asking a lot of any belt when the slope conveyor was installed at this Kentucky coal mine. For, in addition to the usual load, abrasion and threat of mildew, the climb was a tough 16° and over 1000 feet long.

But the G.T.M.—Goodyear Technical Man—was confident when his designed-to-the-job belt was placed on the drive. He felt certain its high strength, mildew-inhibited construction could take the long pull in stride. And it did!

Despite overloads of as much as 150% for long periods, the G.T.M.'s belt, at last report, had *served over 12 years—looked good for years more.* And so well did it serve that its operators have since purchased two Goodyear belts of similar construction for other mines.

What about your belting problem? No matter what the operation—or how tough it might be—the G.T.M.'s your man. He's always within easy reach, too—either through your Goodyear Distributor or by writing:

Goodyear, Industrial Products Division
Akron 16, Ohio

CONVEYOR BELTS by

GOODYEAR

THE GREATEST NAME IN RUBBER

Compass—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

Cincinnati

. . . gives you the ideal trimming chain for Boring Type Continuous Miners

MORE RUGGED

LOW MAINTENANCE COST

SMOOTHER PERFORMANCE

BETTER DESIGNED AND ENGINEERED

SCIENTIFICALLY HEAT TREATED

TROUBLE FREE LONGER LIFE

EASILY SERVICED

FIELD TESTED AND WIDELY ACCEPTED

The CINCINNATI TRIMMING CHAIN is outstanding for use on BORING TYPE CONTINUOUS MINERS. We also manufacture a complete line of the world's finest cutting equipment for use on every type of conventional or continuous miner. Contact one of our representatives or write us direct. Let us work with you.

the **CINCINNATI**
MINE MACHINERY CO.
CINCINNATI 25, OHIO

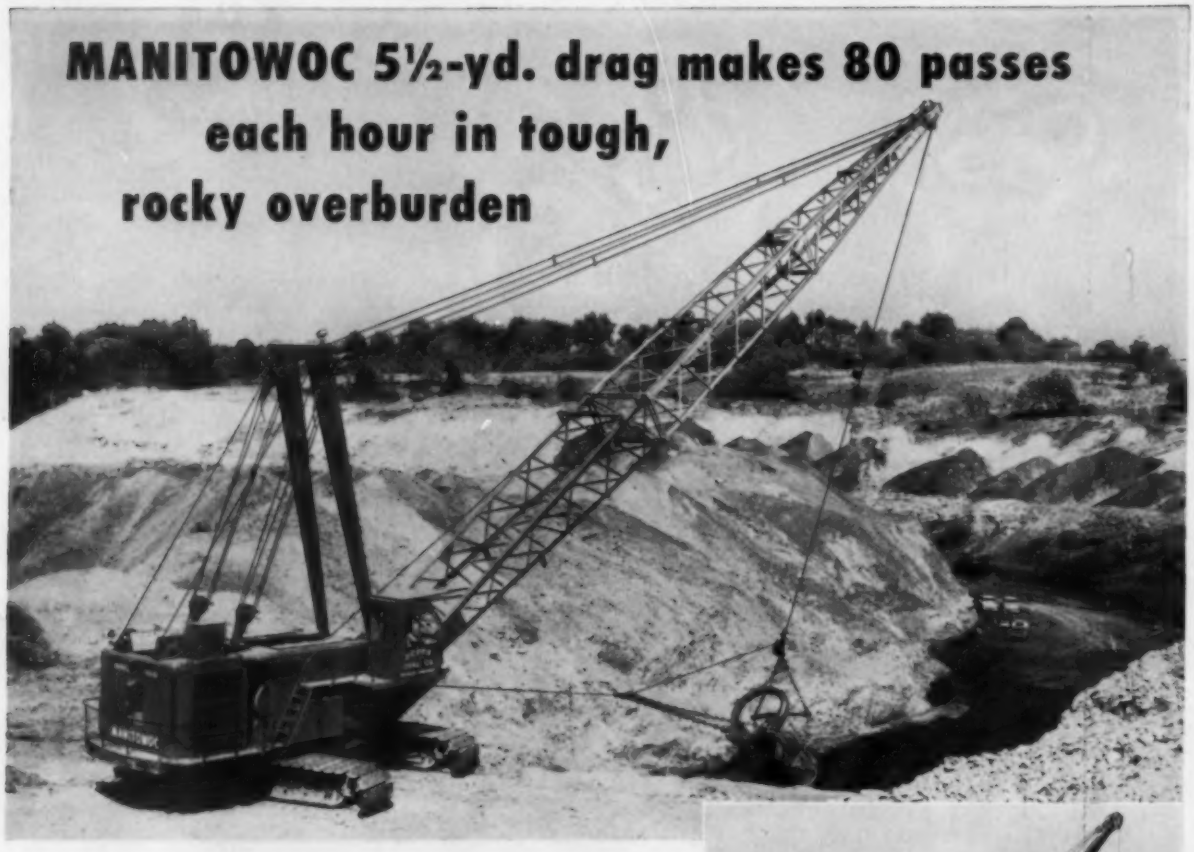
Simplex Wire & Cable Company's new 1,400,000 volt impulse generator — the first of its kind to be installed in North America — represents just one aspect of research at Simplex. Simplex scientists and engineers originated the process of vulcanizing portable rubber cords and cables in a lead mold. Simplex developed the first heavy-duty portable electrical cable — Simplex TIREX. The first truly moisture-resistant rubber insulation was the outcome of a commercially acceptable method of deproteinization developed by Simplex. Simplex designed the first interlocked armored cable for underground service — Simplex CONDEX. And now — Simplex C-L-X — the portable, corrugated metallic duct WITH SEALED-IN CABLE. **SIMPLEX WIRE & CABLE CO.**, Cambridge, Massachusetts and Newington, New Hampshire.

Simplex

LIVE BETTER ELECTRICALLY

Highest quality cables for: Mining • Power & Lighting • Construction • Transportation • Communications • Signalling

MANITOWOC 5½-yd. drag makes 80 passes each hour in tough, rocky overburden



Two 5½-yd. Manitowoc Model 4500 draglines are opening new coal mining areas for the Dodds Coal Co., New Galilee, Pa. Both of the drags operate 20 hours at a stretch, with one unit averaging 80 passes per hour of hard-to-handle overburden. Approximately 8800 cu. yds. are moved each day by this machine, pictured above working a cut 100′ wide and 70′ deep and equipped with a 120′ boom.

The Manitowoc units have the capacity, flexibility and range to consistently produce big output at a profit for the Dodds Co. Since the Model 4500's have a single diesel power package they are not restricted by trailing electrical cables and the need to work close to power installations. Simple design — no complicated electrical motors, switches or miles of wiring — has kept the big draglines working constantly with little downtime for maintenance. All lubrication can be handled from the inside with the exception of the fairlead and seven fittings. And these are greased in minutes, usually during a shift change.

The Dodds Company's Manitowocs were set up in only three days, compared to weeks of set-up time required by other rigs of this capacity. And on-the-job mobility is superior, too, with speed and ease of handling equal to a crawler tractor.

Repeat orders from every coal mining area are proof of Model 4500 performance. Ask your Manitowoc distributor for complete literature and specifications.

MANITOWOC ENGINEERING CORP. MANITOWOC, WIS.

SHOVELS 1-5½ yds.

Manitowoc

CRANES 20-100 tons

REMOVING BOULDERS UP TO 15 TONS APIECE, a second Manitowoc Model 4500 owned by the Dodds Coal Co. works a 200′ wide cut. Skillful handling of the drag enables the huge boulders to be moved with comparative ease. The amount of blasting usually required for removing rough overburden like this is greatly reduced.

HERE'S WHY THOSE WHO KNOW PREFER THE *Lee-Norse* MINER

PATTERN CUTTING—*only Lee-Norse has it.*

CUTS MORE COAL WITH LESS POWER . . . *cutters revolve and oscillate at the same time—milling the coal from the face.*

CUTS A COARSE PRODUCT—FEWER FINES . . . *cutter bits follow a right and left spiral direction producing a diamond pattern which breaks off in coarse cuttings.*

A SIMPLE, STURDY MACHINE . . . *essentially a modern loading machine on which is mounted a set of efficient cutting heads.*

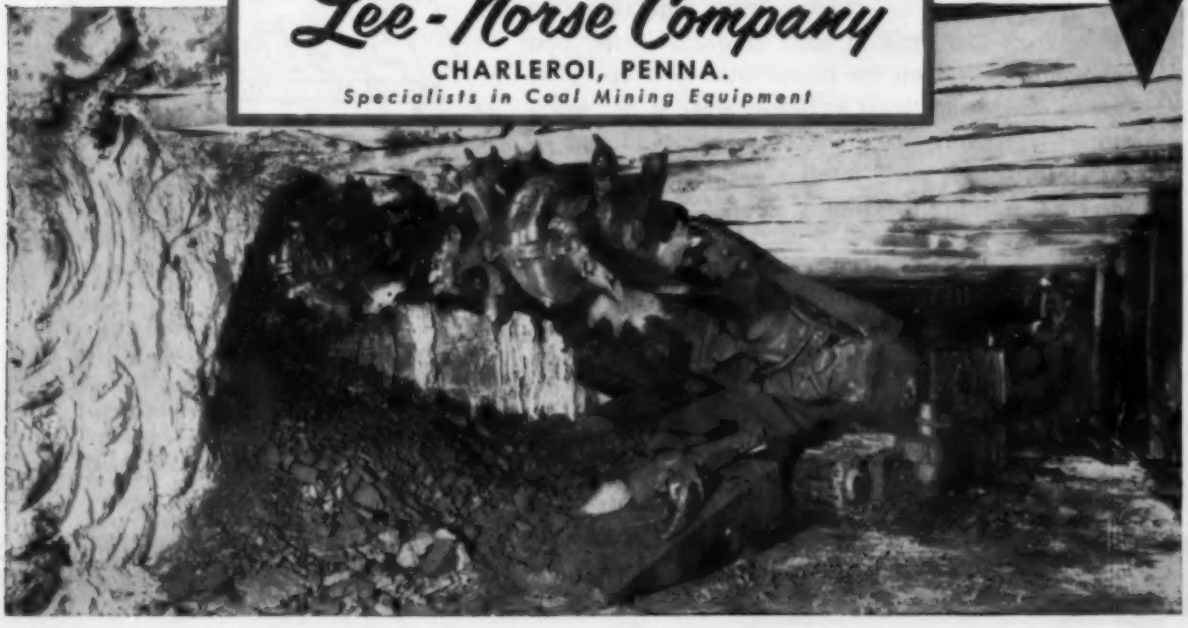
HIGHLY MANEUVERABLE—FAST TRAMMING. . . *not a "muscle-bound giant" . . . it quickly follows any variation in seam thickness.*

EXCELLENT CLEAN-UP . . . *improved dual gathering arms load all the coal into a flexible rear conveyor.*

Lee-Norse Company

CHARLEROI, PENNA.

Specialists in Coal Mining Equipment



FLETCHER DUAL DRILLS with Automatic Feed Control

LATCH DOWN the feed and rotation levers on this Fletcher Model DJ drill — *turn your back on it* — and it will drill a full-depth hole through roof that varies from soft shale to hard sandstone *faster and more efficiently than the best-trained drill operator.* Speed drops and thrust increases when it hits sandstone — instantly — before the bit can be dulled — and thrust drops while rotation and penetration rate increase as softer material is entered.

Fletcher
ROOF CONTROL DRILLS

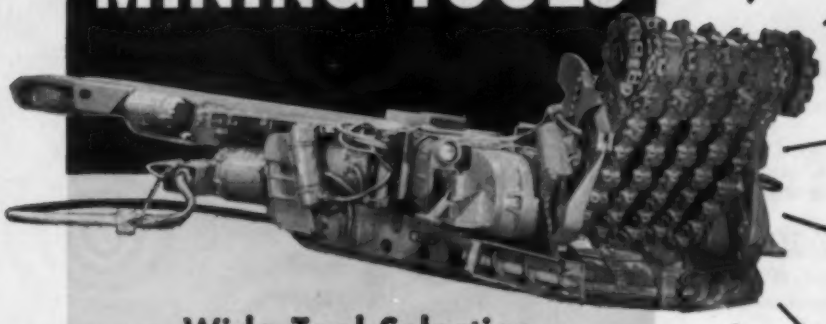
The Results?

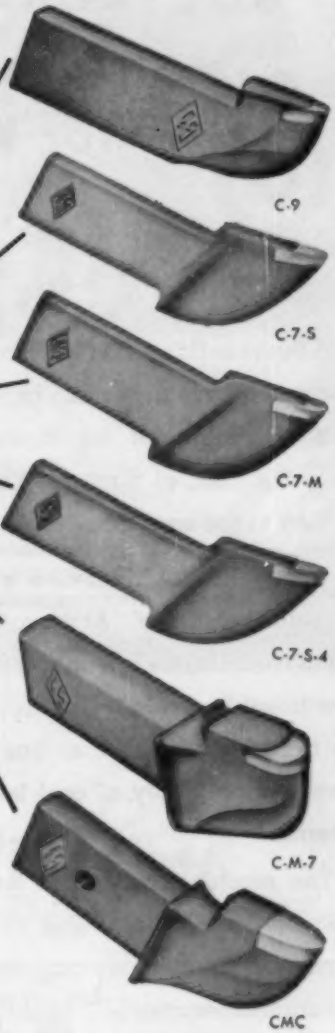
- **More bolts installed per shift!**
- **More footage per bit — so lower bit cost!**
- **Every operator gets top results because no experience or "feel" is required!**

Check with your Fletcher field man on the Model DJ — or any of the many other Fletcher designs. You'll quickly discover *why more Fletcher Drills are in service than all other rotary drills combined!*

J. H. FLETCHER & CO. | P. O. Box 353, HUNTINGTON 8, WEST VIRGINIA
Phone 44186

FIRTHITE
Blue-Bit
MINING TOOLS





Wide Tool Selection for use on . . .

JOY
CONTINUOUS MINERS
for every mining condition

This powerful behemoth of the coal mines, and other mammoth counterparts, depends upon its "teeth" of *Firthite carbide inserts* for fast, dependable, economical mining.

The FIRTHITE Blue-Bit line provides a full complement of cutting tools for each position on the cutting chains and pineapples and for every type of cutting condition. Recommended tools are tabulated at the right, each one designed to do the best possible cutting job at the lowest possible cost.

A Firth Sterling mining tool engineer will be glad to discuss your problems.

YOUR AUTHORIZED FIRTH STERLING MINING DISTRIBUTORS HAVE COMPLETE STOCKS FOR IMMEDIATE DELIVERY.

RECOMMENDED TOOL NUMBER*		Cutting Conditions	Coal	Holder
CHAIN	PINEAPPLE			
C-9	C-7-S	LIGHT TO MEDIUM	Relatively Clean	½" x 1"
C-7-S C-7-M	C-7-S C-7-M	MEDIUM TO HEAVY	Occasional Impurities	½" x 1"
C-7-S-4 C-7-M C-M-7	C-M-7 CMC	HEAVY	Large Quantities Clay Sulphur Rock, etc.	½" x 1"

*FS style CMD available for Drum (Roller) Type Machines

Firth Sterling
—INC—

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.

DISTRIBUTED BY:

AUSTIN POWDER COMPANY—Cleveland, Waynesburg, Evansville, Madisonville, Hazard, W. Frankfort, Clarksburg
UNION SUPPLY COMPANY—Denver
AMOS A. CULP—Birmingham
McCOMB SUPPLY COMPANY—Harlan
CARLSBAD SUPPLY COMPANY—Carlsbad
SERVICE SUPPLY COMPANY—Wheeling
DUNLAP WELDING & SUPPLY—Zanesville
MOLE-BITS COMPANY—Johnstown
U. S. STEEL SUPPLY DIVISION—Pittsburgh
CARL B. LEWIS—Scranton
GUYAN MACHINERY—Logan
THE RAINS SUPPLY CO.—Salt Lake City
SOUTHWESTERN ILLINOIS SUPPLY—DeSoto
COAL BIT COMPANY—Prestonsburg

A-329

PRODUCTS OF FIRTH STERLING METALLURGY

High Speed Steels
Tool & Die Steels
Stainless Specialties
High Temperature Alloys
Sintered Tungsten Carbides
Firth Heavy Metal
Chromium Carbides
High Temperature Cermets
Zirconium

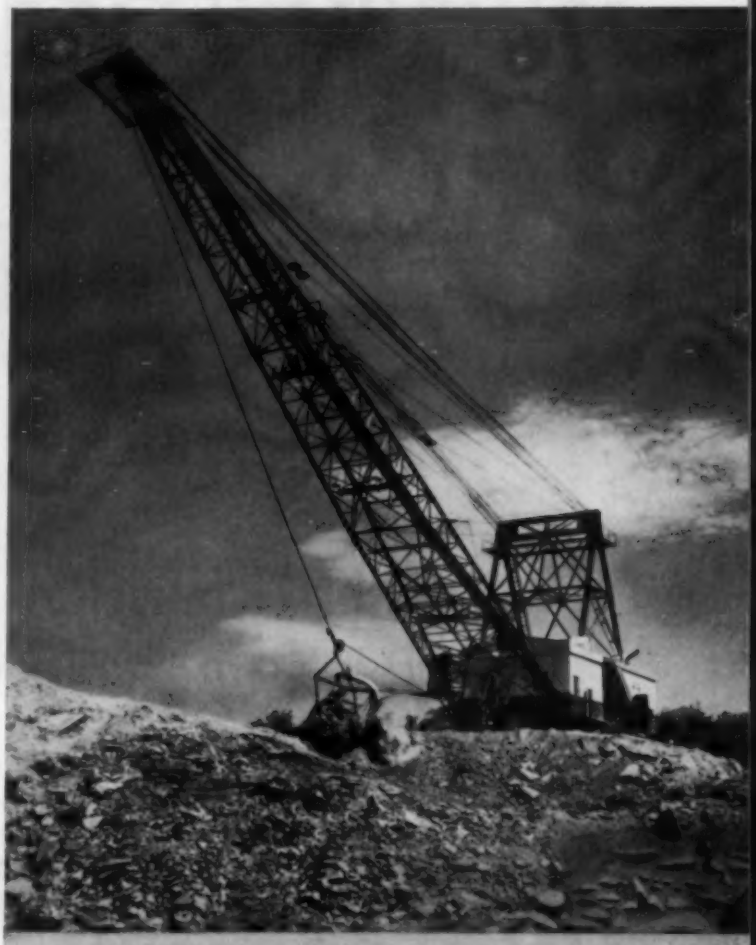
BUCYRUS-ERIE WALKING DRAGLINE
moves overburden fast and far for Kentucky coal company

A Bucyrus-Erie 480-W's big capacity and long reach have materially improved stripping operations at the Riverview Coal Company, Inc., of Hartford, Kentucky, according to the owners.

Hilary Hurst, Riverview's secretary-treasurer, remarked, "At the rate the 480-W has moved dirt, we'll realize a profit on the investment in a relatively short time. After the machine's initial cost has been met, there will be plenty of coal left to be uncovered."

The machine's ability to handle large rocks has reduced the need for secondary blasting, according to company president and mine superintendent Kermit (Jim) Hurst.

This kind of profitable performance is the reason you will find Bucyrus-Erie walking draglines on high-volume earthmoving jobs all over the world. Features such as simple main machinery for year-after-year dependability . . . exclusive walking mechanism for smooth, sure moves . . . front-end design that combines strength with light weight — all have made Bucyrus-Eries outstanding performers for years.



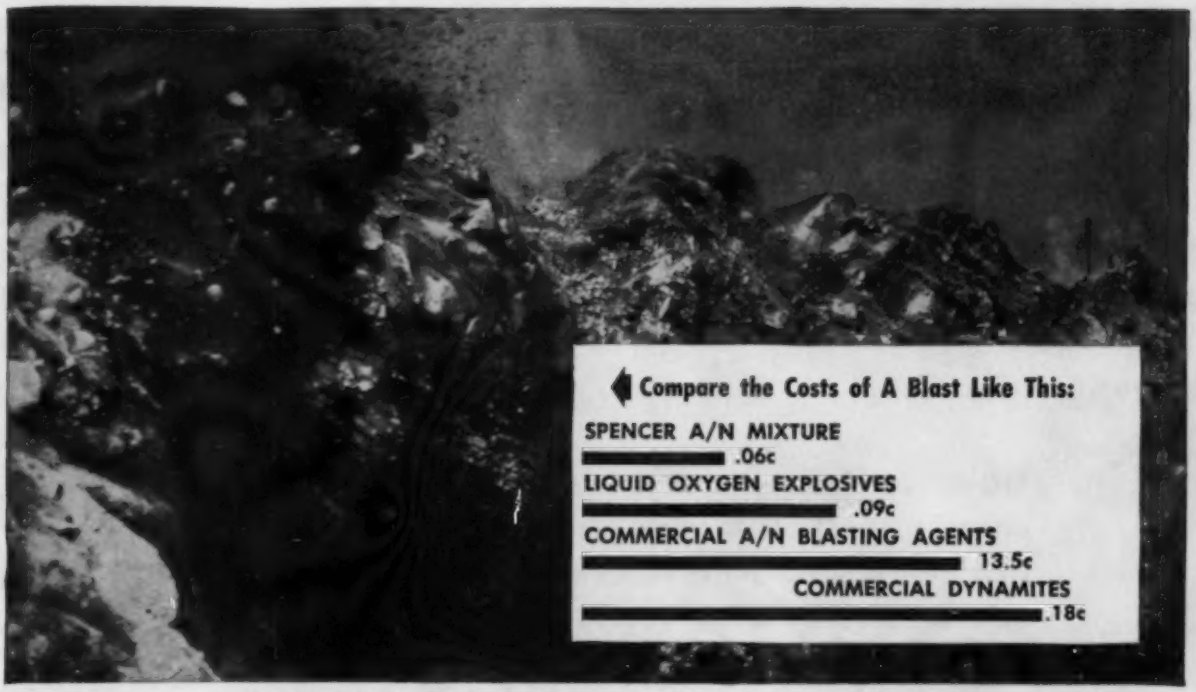
The 480-W at the Riverview Coal Company moves up to 60 feet of overburden consisting of clay, sandstone and shale.

We will be pleased to provide you with full information on the model that's just right for your big-yardage jobs. Ten models are available with bucket capacities starting at 4 cubic yards.

124L57C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN



YOU CAN CUT BLASTING COSTS UP TO 50% with new ammonium nitrate blasting process pioneered by Spencer Chemical Company and Maumee Collieries.

Let Spencer Chemical Company Show You

How To Get Better Results With New Ammonium Nitrate Blasting Process

Maximum benefits from new blasting method demands knowledge of nitrate types, packing, detonation, etc. Pioneer supplier of ammonium nitrate for blasting, Spencer offers you free technical advice and service.

The startling announcement of a revolutionary new, low-cost blasting method was made about two years ago. The technique, developed by Maumee Collieries using Spencer Prilled Ammonium Nitrate, cut blasting costs up to 50%. Also, improved fragmentation made this method about 25% more efficient.

The importance of this new method to you has now been affirmed by practically all major dealers in explosives. But almost each month new data reveals improved techniques by which even greater savings can be made.

Continuing our pioneer work begun with Maumee Collieries—Spencer has since made intensive tests using ammonium nitrate for open-cut blasting for coal, iron, and rock. In fact, Spencer Chemical Company is prepared to offer you the latest and most complete available data about almost every open-cut blasting situation in this hemisphere.

To get the full benefits of this accumulated knowledge and experience, consult Spencer Chemical Company when you are ready to find out for yourself about this wonderful new blasting process. Spencer's special bulletin, "Cut Blasting Costs With Spencer Prilled Ammonium Nitrate," and the most expert technical advice in the country are yours for the asking. Mail the coupon—today!

MAIL THIS COUPON:

Spencer Chemical Company
Sales Supervisor,
Industrial Ammonium Nitrate
400 Dwight Building
Kansas City 5, Missouri

☐ Please send me free Spencer bulletin, "Cut Your Blasting Costs with Spencer Prilled Ammonium Nitrate."

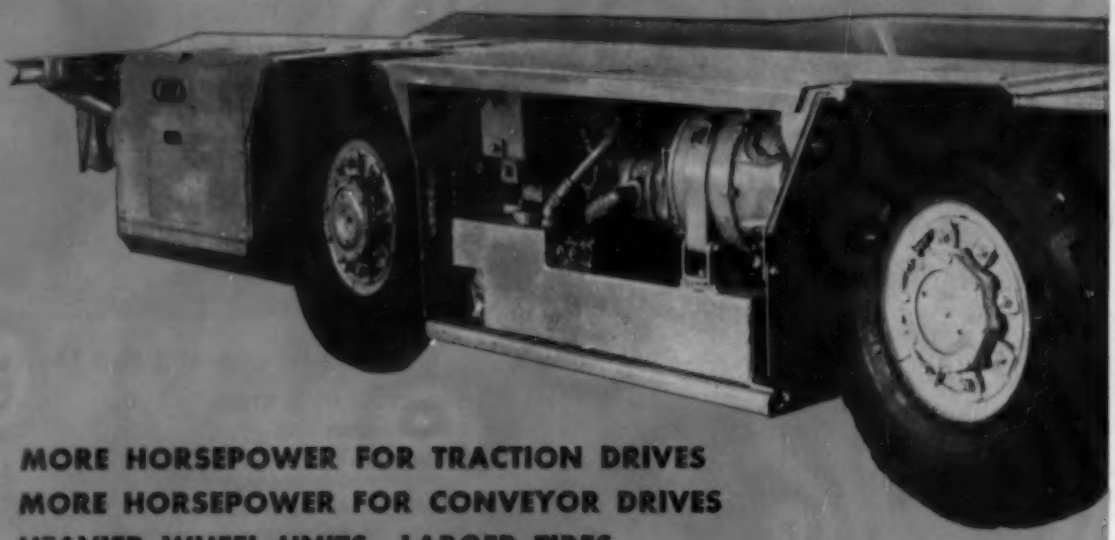
☐ Please have a Spencer Technical Service Representative call—without cost or obligation to me.

Name_____

Company_____

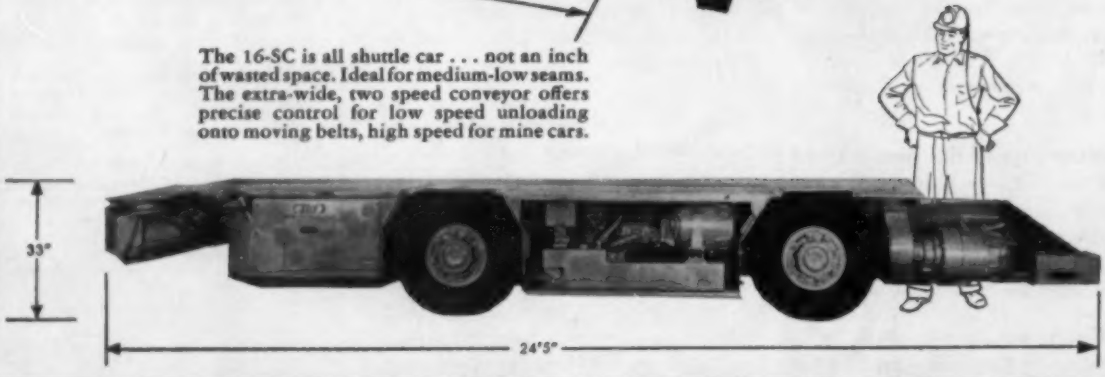
Address_____

Post Office_____ State_____



1. MORE HORSEPOWER FOR TRACTION DRIVES
2. MORE HORSEPOWER FOR CONVEYOR DRIVES
3. HEAVIER WHEEL UNITS—LARGER TIRES
4. SELECTIVE TWO-SPEED CONVEYOR
5. HEAVIER FRAME AND BODY CONSTRUCTION
6. ALL NEW DESIGN—ALMOST MAINTENANCE FREE

The 16-SC is all shuttle car . . . not an inch of wasted space. Ideal for medium-low seams. The extra-wide, two speed conveyor offers precise control for low speed unloading onto moving belts, high speed for mine cars.



A NEW SHUTTLE CAR FOR MEDIUM-LOW COAL

the JOY 16-SC

33" CAR HAS 140 CU. FT. CAPACITY

Write for FREE Bulletin 202-1

The Joy 16-SC has 40 horsepower . . . hauls up to 6 tons at faster speeds (4.1 mph loaded) than any other car of its size. This completely new design is simple, rugged and trouble-free.

Example: The 16-SC has five DC motors; two 2-speed 10 HP traction motors . . . one for each side of the car, two 2-speed 5 HP conveyor motors—and one 10 HP pump motor for the hydraulic system.

Result: All clutches, torque converters, complex gearing and transmissions are eliminated. There's no wasted power. All motors and working parts are easily accessible. The 16-SC has improved four wheel drive and four wheel steering without differentials or tie rods.

And if you're thinking of AC for your mine—AC motors are available on the 16-SC. Of course, other modifications can be made to suit your particular mining conditions.

Talk it over with your Joy engineer . . . he'll show you why it will pay to put Joy's 20 years of shuttle car experience to work. Put a Joy 16-SC on the job. ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Limited) Galt, Ontario.*

JOY EQUIPMENT FOR MINING...FOR ALL INDUSTRY

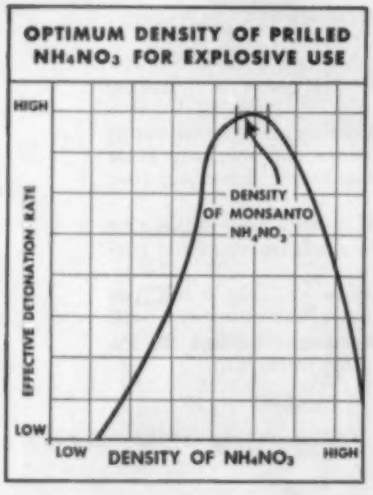
WSW CL 6651-202

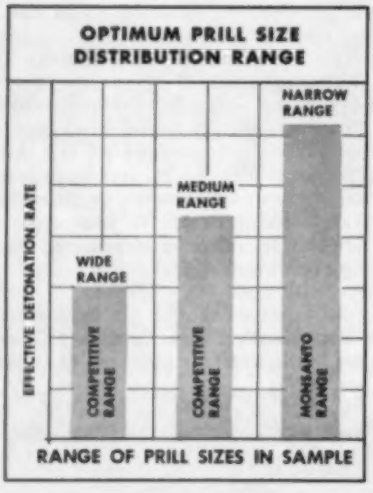
CONTINUOUS MINERS, MOBILE LOADERS, SHUTTLE CARS, COAL CUTTERS, CUTTING MACHINE TRUCKS, COAL DRILLS, CONVEYORS, TIMBER SETTERS, SHUTTLE CAR ELEVATORS, BELT FEEDERS, FANS, BITS, PORTABLE BLOWERS, COMPRESSORS, ROCK DRILLS, HOISTS, CORE DRILLS

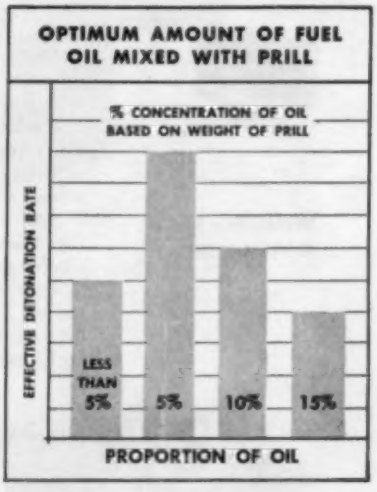
ANNOUNCING RESULTS OF USE OF AMMONIUM

Monsanto is the world's largest manufacturer of prilled ammonium nitrate—and the world leader in developing the use of NH_4NO_3 as an explosive for open work. Presented here is information about the new top-quality product that Monsanto research has developed to give you the optimum in savings, safety, speed, ease of handling: Lion Brand Ammonium Nitrate for use as an explosive.

MOST EFFECTIVE NH_4NO_3 FOR EXPLOSIVE USE







LION BRAND AMMONIUM NITRATE is produced according to the specifications determined by these findings of Monsanto research. Its prill size, density, and other properties are in optimum balance to give you the most effective performance when it is used as an explosive for open work.

MONSANTO RESEARCH IN NITRATE AS AN EXPLOSIVE

TYPICAL SHOT WITH MONSANTO PRILLED NH_4NO_3

View of area involved in the blast. Shot was made in heavy columnar basalt at dam site.

View at time of detonation. The system of detonation recommended by Monsanto, in conjunction with Monsanto's ammonium nitrate, will yield equivalent pound-for-pound results with 60% gelatin dynamite at one-fourth the cost.

Results of blast. The powder factor in the shot above was 0.4 pounds per cubic yard. Breakage of rock was considered ideal by contractor.

Photos courtesy of MORRISON-KNUDSEN CO., INC.

IMPORTANT FACTS ABOUT MONSANTO EXPLOSIVES SERVICES

1. Leadership in ammonium nitrate explosives research now makes Monsanto the source of newest information in this field.

2. A report presenting the latest research findings on the use of ammonium nitrate as an explosive—given by Monsanto to the Mining Society of AIME, October 1957—is available upon request.

3. Monsanto's experienced staff can give you the finest, most complete technical service. The benefit of this experience is available to you. Just phone Monsanto.

4. Monsanto's Lion Brand Ammonium Nitrate is immediately available to meet your needs. Monsanto is the world's largest manufacturer of prilled ammonium nitrate.

CALL ST. LOUIS MAin 1-8900 COLLECT—OR WIRE NOW FOR COMPLETE INFORMATION

MONSANTO CHEMICAL COMPANY, Inorganic Chemicals Division
Dept. B, St. Louis 1, Missouri • In Canada: Monsanto Canada Ltd., Montreal

Monsanto®

WHERE CREATIVE CHEMISTRY WORKS WONDERS FOR YOU

How to hold up a mine roof of sandstone and shale

Here in this Western coal mine haulageway is an outstanding example of Bethlehem Yieldable Arches at work. The overburden runs between 1450 and 1600 feet thick, and the material immediately surrounding the opening is soft shale and sandstone which, without support, would cave from sloughing.

In order to keep the haulway safe until the seam could be mined out, the mine operators installed Yieldable Arch sets on 2-ft centers, along with an unusually neat job of lagging. Because the Yieldable Arch is designed to "give" gradually, rather than break or let go, these sets helped to induce a natural arch in the overburden and bring peripheral forces into equilibrium.

Each Yieldable Arch set is made up of segmental U-shaped sections which nest together to form an overlapping joint. The joint is secured by heavy U-bolt clamps, thus providing the yieldability feature. The degree of yieldability is determined by the tightness with which the bolts are drawn up.

Yieldable Arches usually outlast timbers or other rigid supports. Because of this and their high recoverability, they can be counted upon to repay their original cost rapidly. Some mines have found that their Arches paid for themselves within six months! A Bethlehem engineer will gladly discuss roof-support with you in terms of your own particular problems. He can be reached through the nearest Bethlehem office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM YIELDABLE ARCH

BETHLEHEM STEEL

Crawler units are chain-driven from the propelling machinery. Each crawler is independently controlled by an air-operated friction clutch and band brake. Moves can be made up or down a grade of approximately 30% with the derrick up or down. This 40-R moves up to a new location at a Pennsylvania mine.

Manual effort is reduced to a minimum on Bucyrus-Erie rotaries by a remote-controlled, power-driven drill pipe rack which adds or removes drill pipe. Any one of four reserve pipes can be moved into position over the hole and screwed tight by power. The rack also stores pipe not in use. Hole can be drilled continuously for the full length of the pipe before an additional pipe section has to be added.

Continuous drilling progress at this Illinois mine is assured by an exclusive Bucyrus-Erie combination of features — variable drilling speed through Ward Leonard control, and variable down pressure through hydraulic motor control. Operator has smooth, instant, command over rotation of the drill pipe . . . can choose the most efficient speed for a given formation, and vary the speed as needed without stopping the drilling operation.

Cost-Cutting Features Make Bucyrus-Erie Rotaries Favorites in Major Coal Fields

Workmen at an Indiana mine cover a charge with stemming material provided by the 50-R, at right. During drilling, the 50-R uses air bailing to remove cuttings and to cool the bit. Fine cuttings are picked up and handled by a precipitator; heavies pile up around the hole . . . make excellent and economical stemming material.

These and other Bucyrus-Erie features are bringing greater economies to coal mines and other open pit operations across the country. Some of the reasons why are indicated in the accompanying captions. For more information on Bucyrus-Erie rotary drills — the 50-R, with electric power, for drilling 9⅞- to 12¼-in. holes; the 40-R, with diesel-electric or full electric power, for drilling 6¾- to 9-in. holes — write, call, or see us today. 55B57C

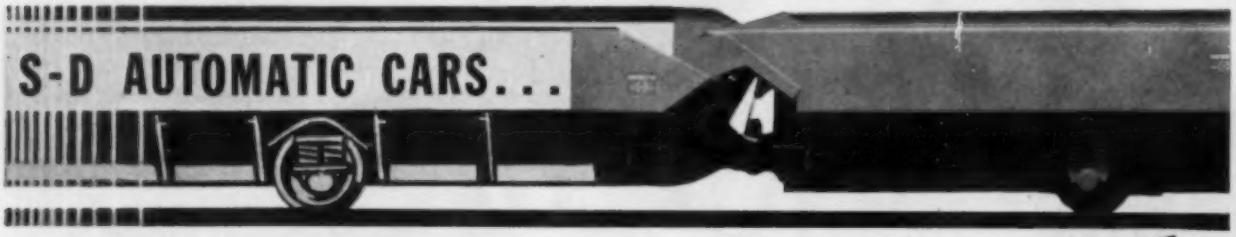
BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

Another mine car development by Sanford-Day...



TWIN LATCHES FOR SAFE AND SURE LATCHING

With S-D "Twin Safety Latches" your bottom dumping car doors are actually padlocked twice. They are tripped independently by a pair of tripping devices mounted between rails.

SAFETY SEALED AGAINST DUST LEAKAGE

Cross-sectional view at right points out how flares extend over doors when closed, sealing material in car.

1/4 to 1/2 TON MORE CAPACITY

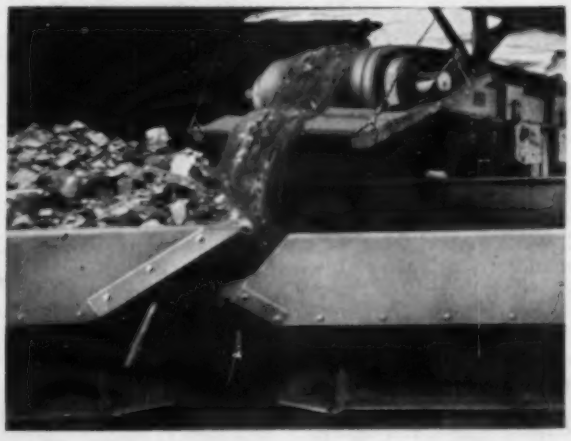
If you were buying, for example, 16 bottom dumping cars of any other make with a 4-ton level full capacity, you would need only 14 S-D Automatics of the same overall dimensions to haul the same tonnage. You save two cars in every 16 . . . 12½ percent in original investment . . . 12½ percent in maintenance . . . 12½ percent less dead weight to haul. Any one of our sales engineers will demonstrate to your complete satisfaction just how the construction features of Sanford-Day's exclusive bottom dumping car design give you this extra capacity. Assure yourself of the maximum economies bottom dumping cars offer you by buying S-D Automatics!

Now available in S-D Automatics only 32" high!

To meet today's mechanization trends the S-D "Automatic" bottom dumping mine car with *overlapping ends* provides the ideal, practical answer to the question, "How can we obtain continuous loading of trips at loading points?"

In addition to others and the S-D "Automatic" illustrated, we recently manufactured and shipped to a Kentucky mining company the same design car, but only 32" high, 6'8" in width, 19' center-to-center of couplers and having an inside body length of 16'. In addition to *overlapping ends*, you also obtain in S-D "Automatics," and only in S-D "Automatics": 1 — "Twin Safety Latches" for safe and sure latching . . . 2 — Cars that are Safety Sealed against dust leakage, and 3 — ¼ to ½ ton more capacity per car for the same overall dimensions! Write us today for complete information! *Sanford-Day Iron Works, Inc., Knoxville, Tennessee.*

Pictured below is a trip of S-D "Automatics" with Overlapping Ends in actual operation. The car above (and further illustrated at right and left) is one recently ordered by a large company. It is 7' in width, 44" high, 20' center-to-center of couplers with an inside body length of 16½ feet. It further features spring mounted trucks and automatic couplers.



SANFORD-DAY

Knoxville, Tennessee

Dump in *one second* with Dumptor®

On the above operation, Koehring Dumptor drives up to the hopper, body forward. Operator trips the body-release lever, and *gravity* tilts the 6-yard body 70 degrees. One second later the load is out, and Dumptor is on its way back for the next load. Because there is no waiting for slow-acting body hoists, *gravity-dumping* saves 15 to 25 seconds on every round trip. This adds up to a substantial increase in extra yards per hour. For instance — take a typical 1,000-foot haul, where you normally would make 16 trips an hour. By saving an average of 20 seconds dump-time on each trip, Dumptor gains 320 seconds, or 5.3 minutes more productive haul-time an hour. You get 17½ trips, instead of 16. This, alone, adds 9% to hourly production. What's more, there are no expensive hoist-replacement parts, or hoist maintenance time. *Gravity-dump* never wears out, never balks. You get the same one-second dumping *every time,* under heaviest loads, in all temperature extremes. Better check what this can mean in lower costs, and increased production on your hauling operations. Get the complete Dumptor story from your local Koehring distributor. *Call him today.*

Plenty of power on the haul – You get better than 6 h.p. for every ton of loaded weight when you haul with heavy-duty Dumptor. That's why it accelerates fast, pulls through soft ground, up ramps and grades with less shifting — climbs 24% grades fully loaded. When hauling heavy materials, extra horsepower means extra load-carrying capacity.

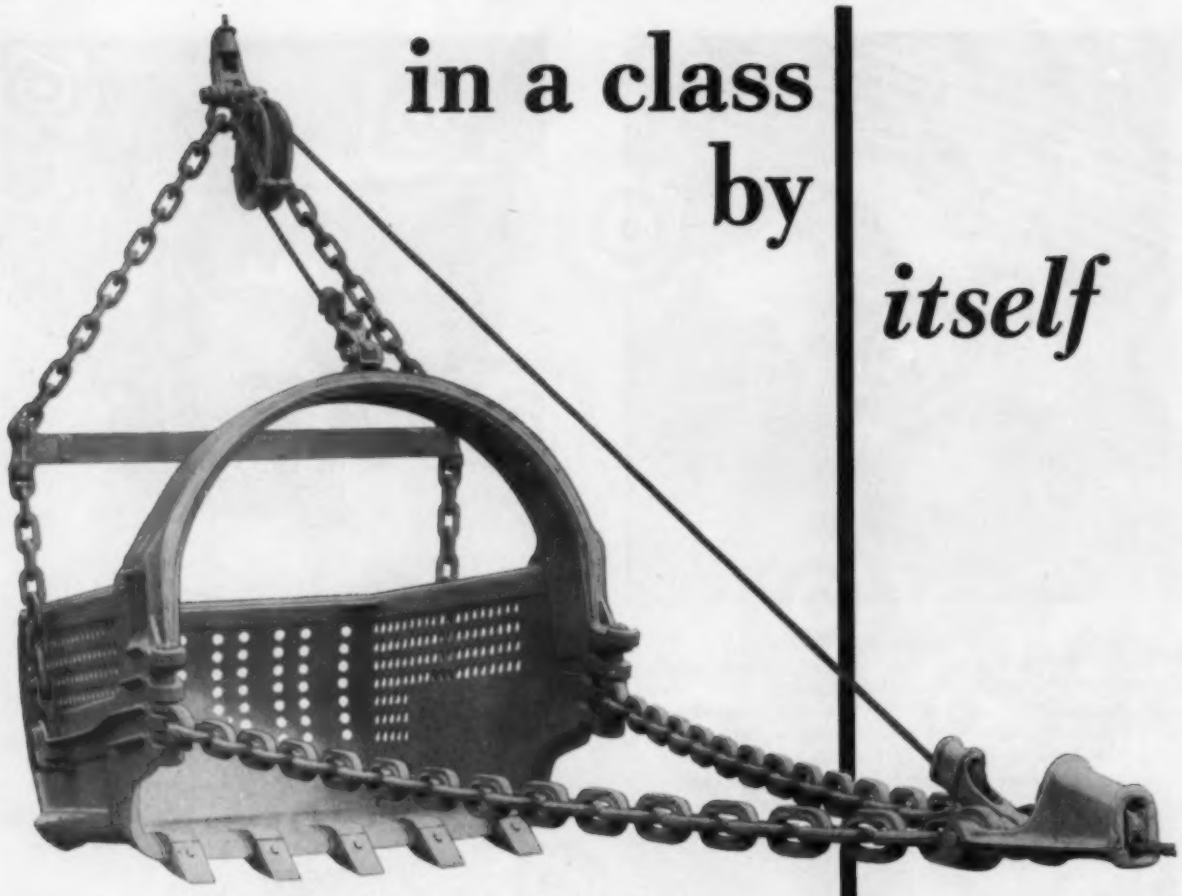
No-turn shuttle hauling – Dumptor solves problems of operating in tunnels, along overhead trestles, or narrow haul roads. There is no need to turn, because it travels with equal ease, power and speed in either direction. No-turn hauling offers a big production advantage, too. Every turn saved cuts 15 seconds off cycle time, increases output.

Easy-loading target – Big, 64 square-foot body opening permits loading Dumptor over the side or either end. This saves spotting time, reduces spillage. Heavy duty body is built for rock. Top edge and bottom are box-beam constructed. Sides and ends are rib-reinforced. In fact, Dumptor has a ton of strength for every ton of payload capacity.

Time-saver on stockpiling – Dumptor puts stockpiling on a fast shuttle-haul basis — eliminates turning on top of pile. Notice how instant dumping action kicks the load out over edge of pile — saves a lot of dozer clean-up. Free-swinging kick-out pan breaks load suction in wet, sticky materials, bolts down to floor when handling rock.

KOEHRING COMPANY, Milwaukee 16, Wis. Subsidiaries PARSONS KWIK-MIX • JOHNSON KOEHRING-WATEROUS LTD. KOEHRING HEAVY DUTY 5646

in a class by *itself*



"HENDRIX MH" Heavy Duty Mining Buckets

- HIGHER ARCH
- GREATER WIDTH
- TAPERED BASKET
- ARCHED LIP
- EXTRA REINFORCING THROUGHOUT

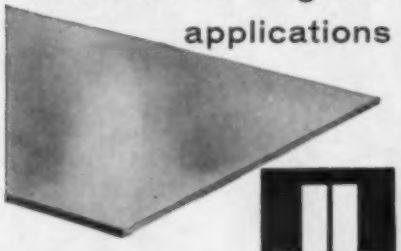
4½ to 14 Cubic Yards With or Without Perforations

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

Hendrix DRAGLINE BUCKETS

JALLOY special alloy steel

resists impact and abrasion in toughest applications



Heat treated Jalloy steels wear as much as 20 times longer than mild steels under rigorous impact and abrasive conditions. By using Jalloy you can cut maintenance cost drastically. Increased product life reduces downtime and lowers your labor costs.

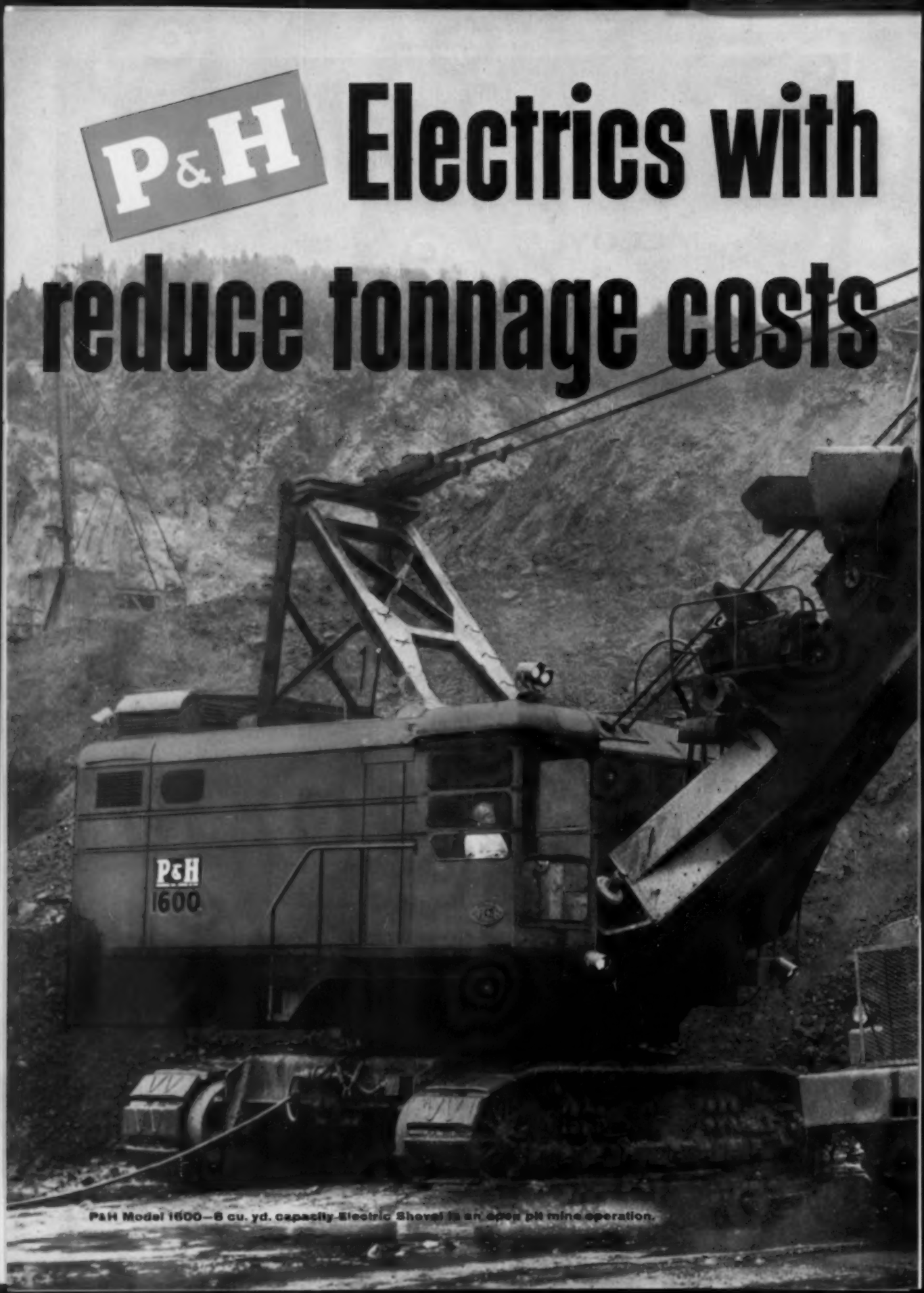
Jalloy steels are available in the forms you require (plates, hot rolled sheets, hot rolled bars, small shapes and structurals). Jalloy can be purchased in three grades to meet specific use requirements: Grade 1, where formability is important; Grade 3, capable of being heat treated to excellent physical properties for good resistance to abrasion or wear; Grade 7, for high hardness with good ductility or wear resistance.

Your local distributor can supply you with latest information on these Jalloy grades, or you can write to Jones & Laughlin, Dept. 411, 3 Gateway Center, Pittsburgh 30, Pa.

Jones & Laughlin STEEL

. . . a great name in steel

P&H Electrics with reduce tonnage costs



P&H Model 1600—6 cu. yd. capacity Electric Shovel in an open pit mine operation.

MAGNETORQUE®
in heavy digging

Exclusive P&H MAGNETORQUE® hoist drive puts more power into the bank when you need it, working smoothly, steadily and efficiently under progressively tougher digging.

MAGNETORQUE transmits power from the shovel hoist motor to the dipper magnetically for faster action and at the same time, eliminates shock and impact to the hoist gear train and motor. Response is immediate to varying load conditions.

ELECTRONIC CONTROLS, exclusively designed and built by P&H, provide fastest action of any type of control known. All shovel motions are smoother, resulting in consistently higher output.

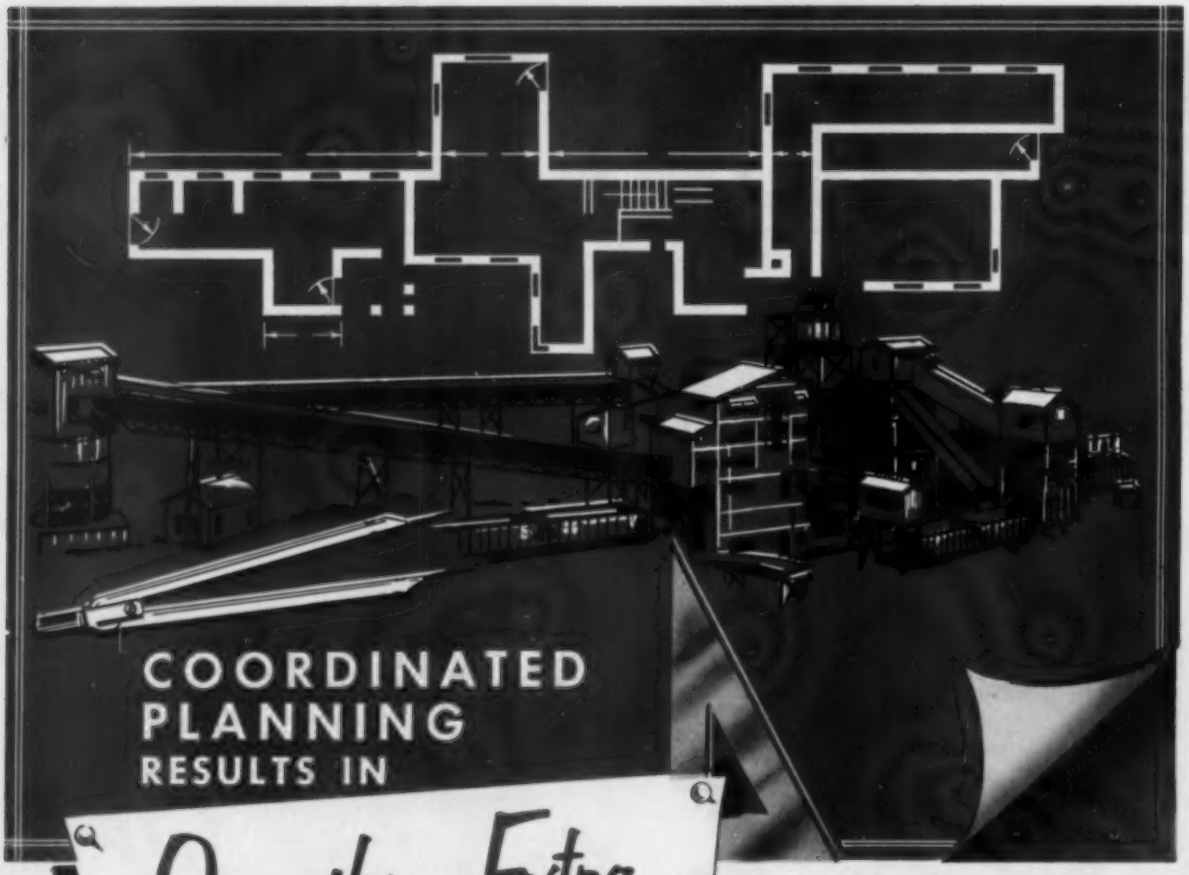
With MAGNETORQUE, P&H ELECTRONIC CONTROLS and P&H scientific weight distribution you get higher line pull per cu. yd. of dipper capacity resulting in increased dipper fill factor . . . more production at lower cost.

P&H designs, manufactures and applies all electrical equipment specifically for electric shovel service.

P&H Electric Shovel Line:
3½ through 8 cu. yd. capacities

HARNISCHFEGER

CONSTRUCTION & MINING DIVISION
Milwaukee 46, Wisconsin



WITH EVERY

FAIRMONT

PREPARATION PLANT

For more than half a century Fairmont Machinery Company has been producing coal handling and preparation plants with "Something Extra"! "Something Extra" which is the direct result of painstaking coordinated planning plus responsibility. Here, then, are the reasons why a coal preparation plant by Fairmont is a model of top operating economy and notably increased separating efficiency—both of which lead to the upgrading of your product . . . a vital factor in pleasing today's discriminating coal buyers.

TURN TO FAIRMONT for the "Extras" which will put you out ahead:

1. *Coordinated, qualified engineering, fabricating and erecting.*
2. *Choice of equipment best adapted to your specific requirements.*
3. *Skilled pilot crews to smooth out operational "know-how" of your own men.*
4. *A competently-planned installation for your present needs with provisions to cope successfully with future demands.*

If you have a knotty preparation problem—if you want a plant which will turn out a guaranteed uniform product and give you over 99% separating efficiency through a product size range of ⅛" to 10" in any tonnage capacity—

Call A FAIRMONT engineer.

FAIRMONT MACHINERY COMPANY

FAIRMONT, WEST VIRGINIA

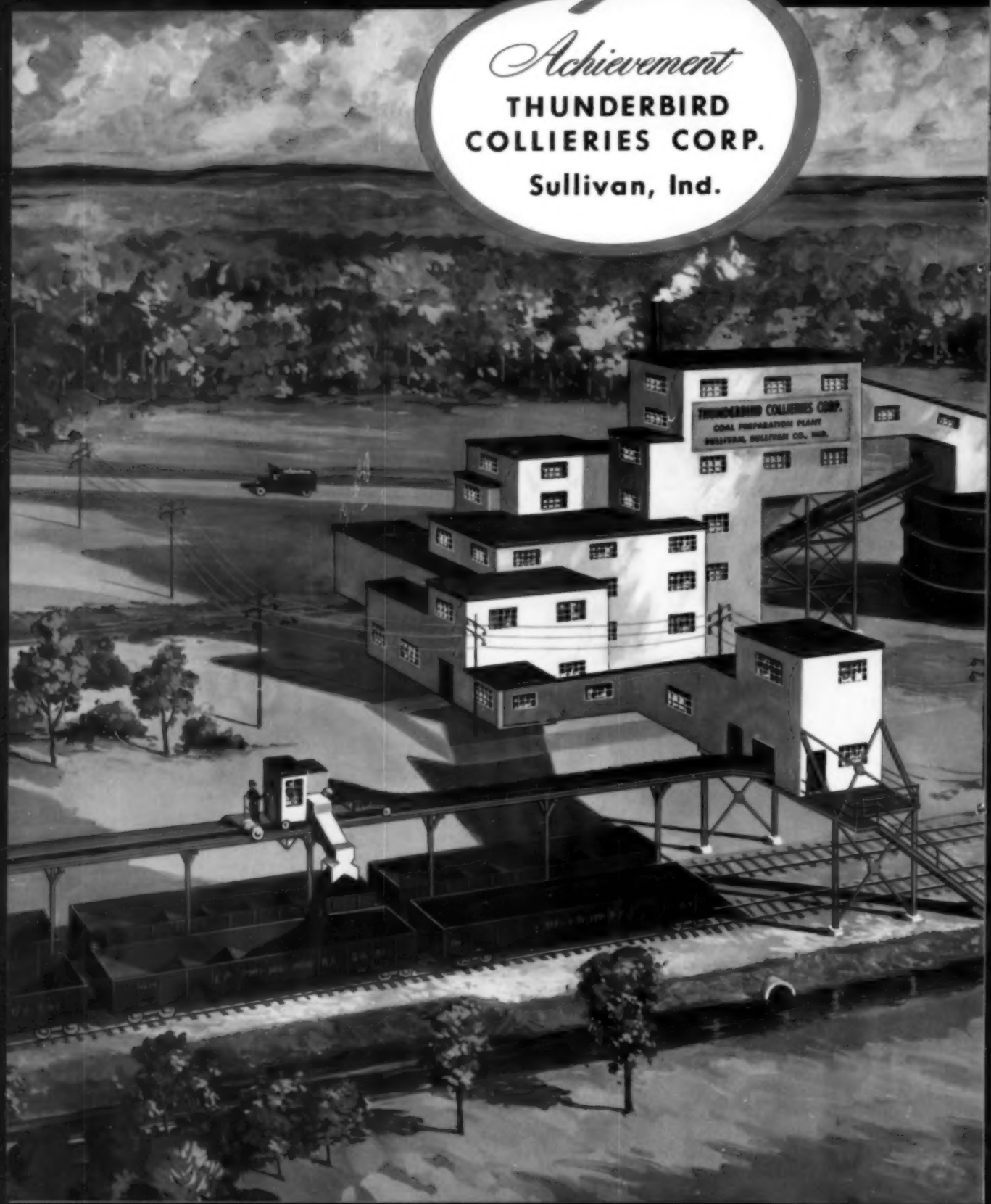
DESIGNERS AND CONSTRUCTORS OF COMPLETE COAL PREPARATION PLANTS USING BOTH WET AND DRY CLEANING, CENTRIFUGAL AND THERMAL DRYING.

HOW THE
THUNDERBIRD
FEATHERS
ITS NEST
THE FUTURE BELONGS TO THOSE WHO PREPARE

For Know-how Ask the

Achievement

THUNDERBIRD
COLLIERIES CORP.
Sullivan, Ind.



Men from McNally Pittsburg

Profits will hatch year after year for the Thunderbird because here is a plant that is geared for the future—geared to compete in the growing market for prepared fuel.

Here the efficient McNally Giant Washer handles up to 750 tph. of 4″ x 0″ directed from the rotary breaker or from the 1000-ton storage bin. The washer is equipped with a middlings crushing circuit, reducing the fuel to 1¼″ x 0″ for recirculation.

The 1¼″ x 0″ washed coal is loaded on cars on either of two railroad tracks through a belt tripper having a 600-foot travel. The loading-out belt conveyor is equipped with a belt-type sampler.

The ⅜″ x 0″ coal is recovered from the settling tank and delivers to two centrifugal dryers. After the moisture is removed, the coal is combined with the washed coal and delivered to the track belt.

You, too, can "feather" your operation for profits when you count on McNally Pittsburg, the men who know coal from the ground up. Whatever your plant needs—McNally has the Know-how to assure changing COAL to FUEL to PROFITS.

McNally Pittsburg Mfg. Corp.

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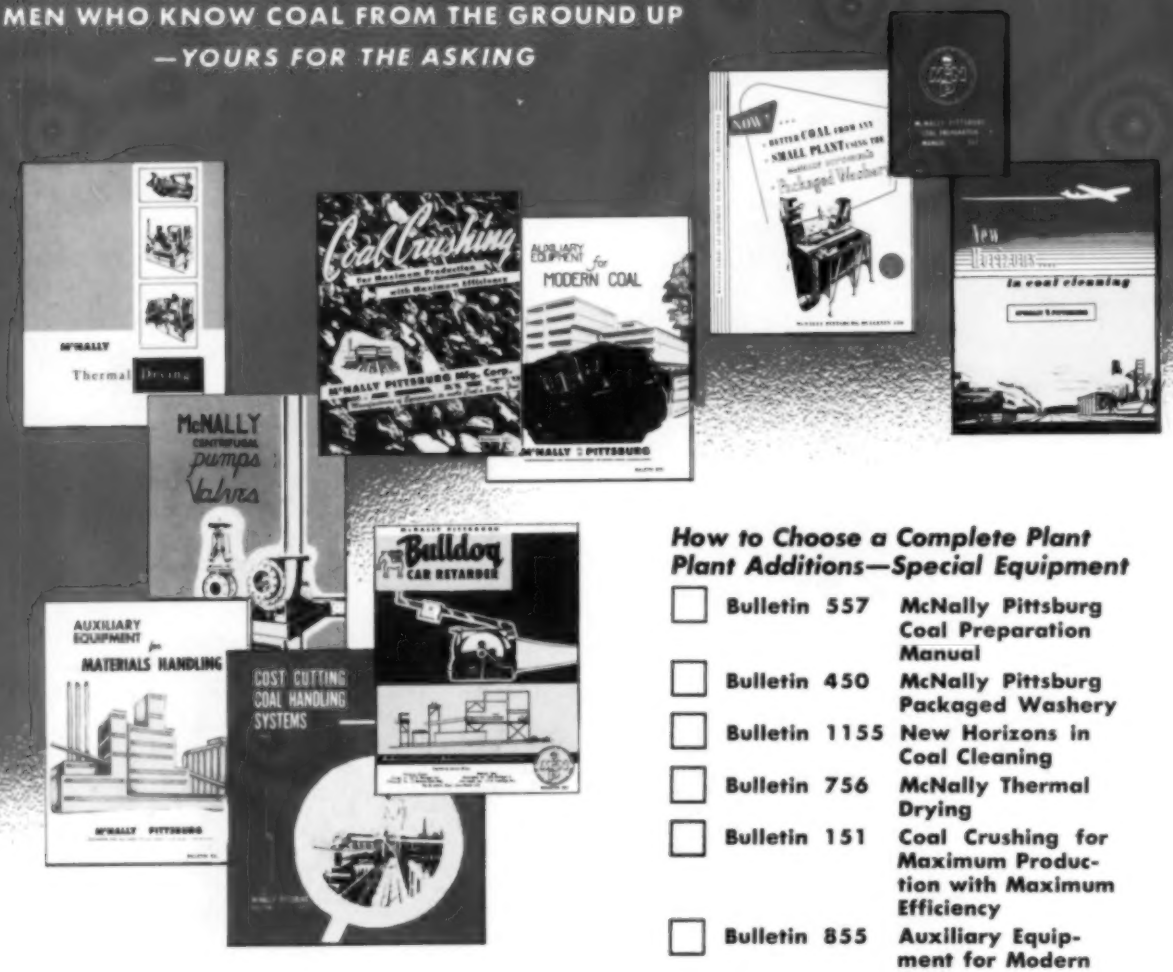
McNally Pittsburg Mfg. Corp.
PITTSBURG, KANSAS

Have You Read These Authoritative Books on Coal Preparation?

• THIS COMPLETE LIBRARY—WRITTEN BY MEN WHO KNOW COAL FROM THE GROUND UP —*YOURS FOR THE ASKING*



How to Choose a Complete Plant Plant Additions—Special Equipment

- ☐ **Bulletin 557** — McNally Pittsburg Coal Preparation Manual
- ☐ **Bulletin 450** — McNally Pittsburg Packaged Washery
- ☐ **Bulletin 1155** — New Horizons in Coal Cleaning
- ☐ **Bulletin 756** — McNally Thermal Drying
- ☐ **Bulletin 151** — Coal Crushing for Maximum Production with Maximum Efficiency
- ☐ **Bulletin 855** — Auxiliary Equipment for Modern Coal
- ☐ **Bulletin 1255** — Cost Cutting Coal Handling Systems
- ☐ **Bulletin 1055** — McNally Centrifugal Pumps—Valves
- ☐ **Bulletin 955** — Auxiliary Equipment for Materials Handling
- ☐ **Bulletin 351** — McNally Pittsburg Bulldog Car Retarder

Gentlemen:
Please send the booklets checked.

- ☐ Bulletin 557 McNally Pittsburg Coal Preparation Manual
- ☐ Bulletin 450 McNally Pittsburg Packaged Washery
- ☐ Bulletin 1155 New Horizons in Coal Cleaning
- ☐ Bulletin 756 McNally Thermal Drying
- ☐ Bulletin 151 Coal Crushing for Maximum Production with Maximum Efficiency
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- ☐ Bulletin 1055 McNally Centrifugal Pumps-Valves
- ☐ Bulletin 955 Auxiliary Equipment for Materials Handling
- ☐ Bulletin 351 McNally Pittsburg Bulldog Car Retarder

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Title_____

Company_____

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C

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MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

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Femco MINE-LITE*

Systems

A day and night difference!

finest design available

exclusive sealed-in ballast

safe permissible systems

portable systems —may be strung anywhere

40 lamps use only 10 amperes

lightweight units only 12 lbs.

sturdy unit stands on its base

easy to change lamps

Now—you can have all the light you need for underground safety and efficiency

SEE a day and night difference in working conditions! Here is fluorescent mine lighting ready for you now.

SEE a day and night difference in design features! Famous Femco engineering has scored again with a superior product.

SEE a day and night difference in maintenance! Top up, old lamp out, new lamp in, no fuse to change.

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Makers of the famous Femco Trolleyphone

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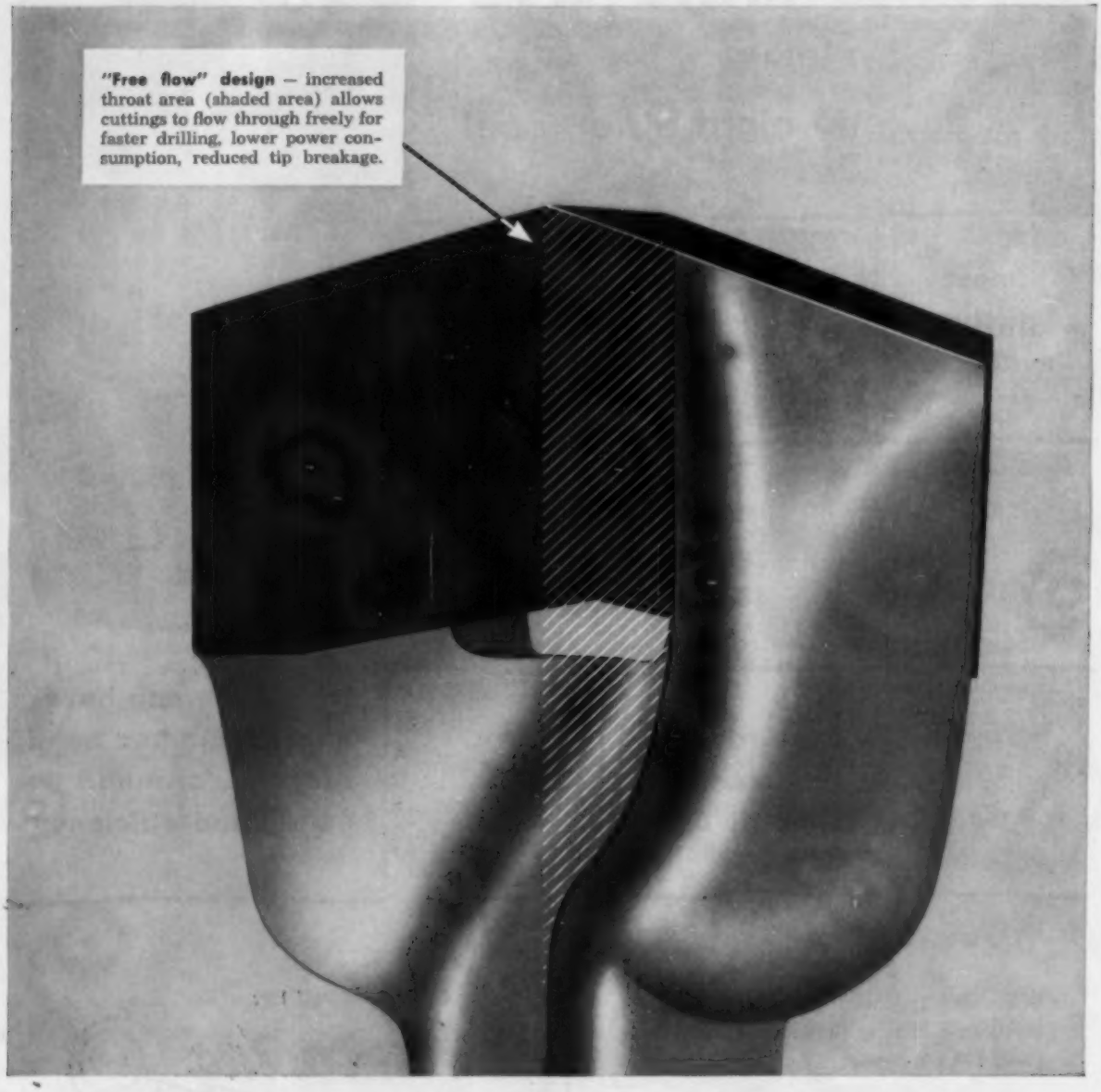
INDUSTRIAL PHYSICS & ELECTRONICS CO., SALT LAKE CITY, UTAH

New from tip to shank!

"FREE FLOW" DESIGN MAKES NEW


"Free flow" design — increased throat area (shaded area) allows cuttings to flow through freely for faster drilling, lower power consumption, reduced tip breakage.

Complete Service Through Factory and Distributor Assistance

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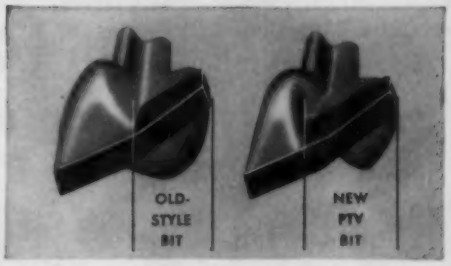
Lee Supply Co.

CARBOLOY® PTV BIT 3 WAYS BETTER!

1 "FREE FLOW" design means faster, easier drilling

Larger throat area allows cuttings to flow through freely – reduces packing and stalling. Result: faster penetration, cooler cutting. Modern heat-treating permits use of less bulk steel without sacrifice in strength.



Old-style bit (left) has more bulk steel on prongs – is more likely to pack and stall. Streamlined PTV (right), with its open-throat design, allows freer flow for faster drilling.

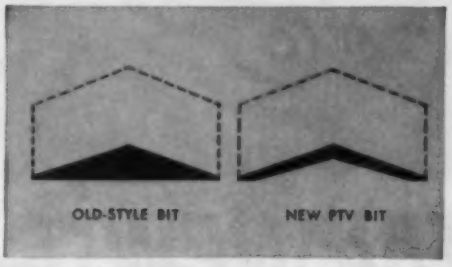
2 "FREE FLOW" design means more economical operation

Bit is easier to recondition, because there is less steel to grind. Power consumption is reduced by freer cutting action. Machine downtime is cut because bits drill longer, more continuously. Also, with a PTV you get almost 100% use of carbide—less wasted carbide after normal life.

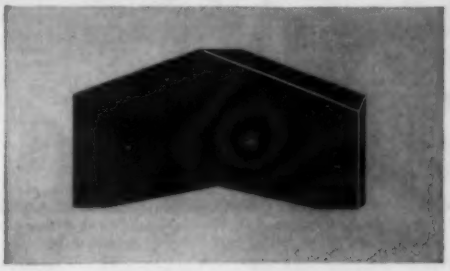
3 "FREE FLOW" design means longer bit life

Less packing and stalling minimize chance of tip breakage – while heat-treating makes the new PTV just as rugged as old-style conventional bits. And in a Carboloy carbide tip, you have the most wear-resistant carbide used in any standard roof bit!

This new PTV bit is now available from your Authorized Carboloy Mining Tool Distributor. Call him today (his name is listed below), or write: *Metallurgical Products Department of General Electric Company, 11120 E. 8 Mile Ave., Detroit 32, Michigan.*



Old-style bit (left) leaves wasted triangular section of carbide (shaded section) after normal life. New PTV (right) gives almost 100% utilization of carbide by eliminating unusable section.



Here's the most wear-resistant carbide on any standard roof bit. Lets the PTV drill longer, more continuously. Economical, too, because it permits many more regrinds.

CARBOLOY®
CEMENTED CARBIDES

GENERAL ELECTRIC

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General Electric Supply Co.
WASHINGTON
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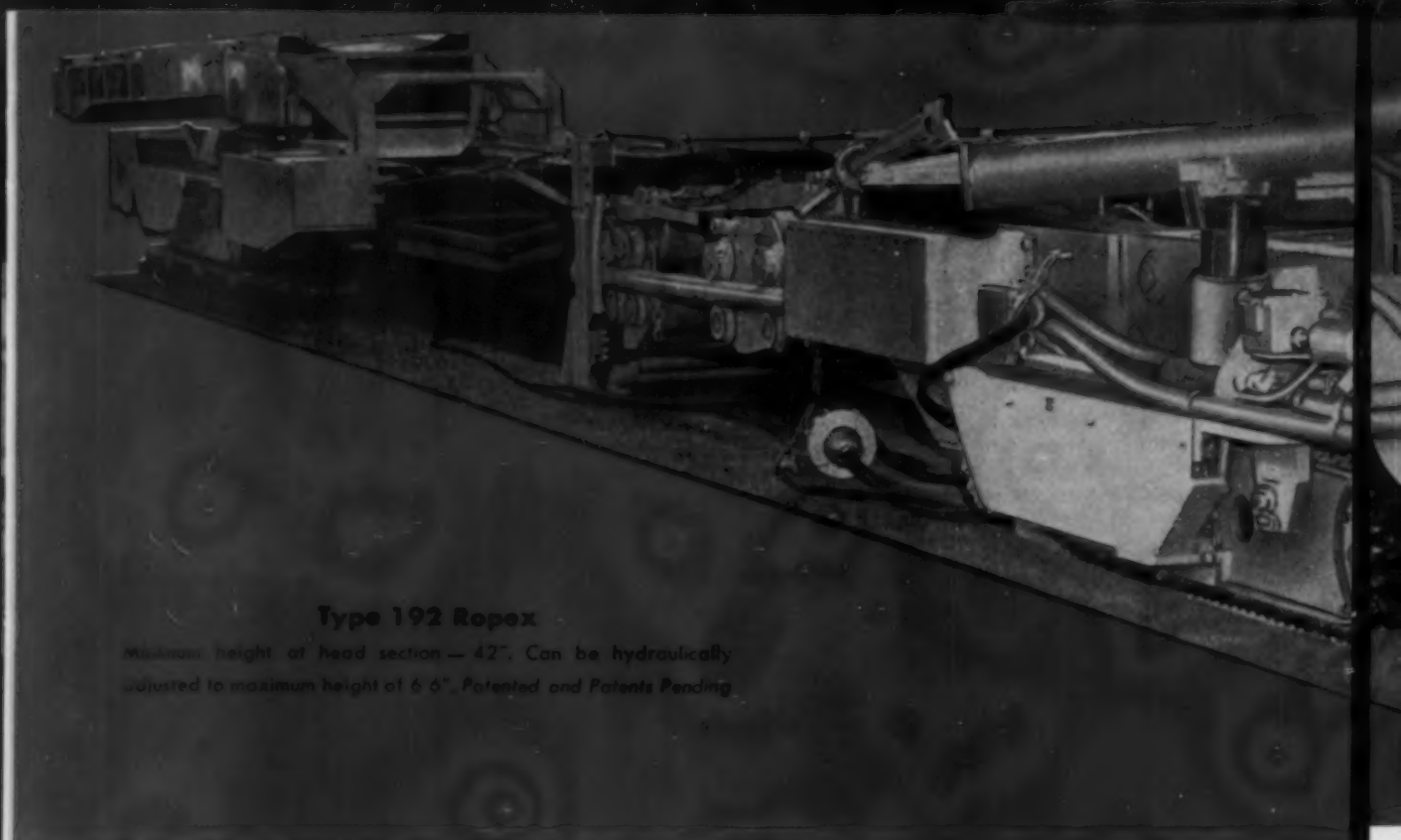
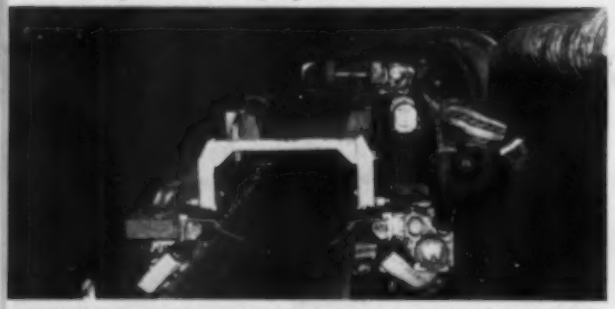


Type 192 Ropex

Maximum height at head section — 42". Can be hydraulically adjusted to maximum height of 6'6". *Patented and Patents Pending*

The NEW Goodman ROPEX®

Bridge conveyor between tread mounted tail section and continuous miner or loader swivels to right or left at both points of contact. Ropex stays in line, loading unit can make sharp angle turns.



■ Ropex is an extensible belt conveyor equipped with tread-mounted, motor-driven head and tail sections. The head section carries an ingenious belt storage system, the tail section is equipped with winding reels for wire rope storage.

■ Ropex has no fixed structural framing . . . no rigid idler assemblies along the belt line. Instead, parallel wire ropes from head to tail carry chain-linked idlers over which the belt travels. Parts are few, lightweight, easy to handle and store. Labor for moving, installing and extending is reduced.

■ Ropex can be extended or retracted while running coal. Predetermined tension on both belt and wire ropes is automatically maintained at all times.

■ Ropex is flexible . . resilient. The wire ropes and hinged idlers "give" in accordance with the weight carried. The load rides smoothly, evenly, with nothing to cause shifting or spilling. At the same time, impact shock on bearings and belt is reduced to a minimum.

Here's a good example of Ropex Efficiency

At one operation where coal was mined at 6½-foot height, the Ropex and bridge conveyor moved 1476 tons in one shift. The average tonnage moved per shift exceeded 900 tons. And when an extended length of 600′ was reached the unit was "knocked down," moved 880′ and set up ready to run in 1½ hours.

This remarkable efficiency is typical of Ropex Conveyors wherever installed.

Belt to permit extension of Ropex is stored in framework attached to head section. Open construction eases task of adding belt, permits ready inspection, provides rub-free belt travel. Provisions available for storage of as much as 200 feet of belt. Entire storage system is carried in head section when unit is moved—without unthreading the belt.

Extensible Belt Conveyor

moves coal from the face as fast as it can be mined by any Continuous Miner or Loading Machine

Here is a fast, 36" width conveyor that actually extends itself . . . increases its own length . . . under its own power. It advances as the loading unit advances . . . keeps pace with the face . . . eliminates delays and interruptions . . . provides a continuous flow of coal back to the out-of-mine transportation system.

The Goodman Ropex Conveyor is linked to a continuous mining machine or loader by means of an independent motor driven bridge conveyor with a 10 foot range of travel on the tail section. As the loading unit advances to the limit of this range, the tail section of the Ropex Conveyor is trammed forward. Belting and wire rope pay-off automatically. Supporting stands and idler assemblies are added at the tail section as needed. Meanwhile the flow of coal from the face need not stop for a moment during a full 100-foot advance. At that point a new section of belting is easily added and continuous operation is resumed.

The efficiency and smooth, continuous operation of the Goodman Ropex Conveyor have been thoroughly proved at mine installations behind continuous miners and loaders, and even for shuttle car loading. It is ready to serve you. Let us give you the story in full detail.

® Registered Trademark

GOODMAN

MANUFACTURING COMPANY

Halsted Street and 48th Place, Chicago 9, Illinois

CUTTING MACHINES • CONVEYORS • LOADERS
SHUTTLE CARS • LOCOMOTIVES • CONTINUOUS MINERS

Use Genuine Goodman Replacement Parts

How to Install Bethlehem Roof Bolts

Illustrated here are four simple steps to take when installing Bethlehem Square-Head Roof Bolts. Regardless of the length and diameter of the bolts used, this procedure enables the job to proceed at a steady pace, and helps materially in minimizing installation costs.

Bethlehem Square-Head Roof Bolts are made in ⅝-in., ¾-in., and ⅞-in. diameters, and are furnished in a wide range of lengths. We also manufacture a 1-in. slotted roof bolt, for use where a heavier bolt is required.

We recently issued an interesting 20-page illustrated catalog on roof bolting. If you would like to have a copy for reference, all you need do is drop a line to the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

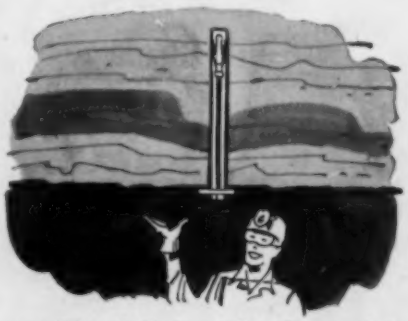
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

1 Using regular drilling equipment, the hole is drilled to required depth.

2 The assembly, consisting of roof bolt, square roof plate, malleable-iron shell and steel plug, is inserted in the drilled hole.

3 Bolt head is tightened with power wrench. This draws down the plug, expanding serrated leaves of shell



4 The shell is anchored securely. Square roof plate furnishes additional support. Steel ties, connecting a series of holes, may be substituted.

"Euc" dependability maintains production for Skyline Coal Co.

Powered by a 218 h.p. diesel driving through a five-speed transmission and the Euclid performance-proved planetary drive axle, the Model R-18 has a top speed of 27 mph with full payload.

In Evanston, Kentucky, the Skyline Coal Company is producing 2000 tons of coal daily from an abandoned strip mine. Secret of their achievement is the auger method of mining—and reliable hauling equipment!

The coal is loaded directly into the waiting Rear-Dump haulers . . . three Model R-18 Euclids. With a narrow pit, the easy maneuverability of the "Eucs" enables drivers to spot the Rear-Dumps under the loader without delay. The "Eucs" haul the coal 1¼ miles to a head-house where it is dumped and stockpiled for the preparation plant. At Skyline, as on many other mining operations, Euclids have proved their dependability for low-cost production around the clock.

Whether they're hauling coal or overburden . . . on long or short hauls . . . "Eucs" move more loads at lower cost per ton. It will pay you to have your Euclid dealer give you facts and figures on the complete line of Euclid equipment. He'll be glad to show you why ***Euclids are your best investment.***

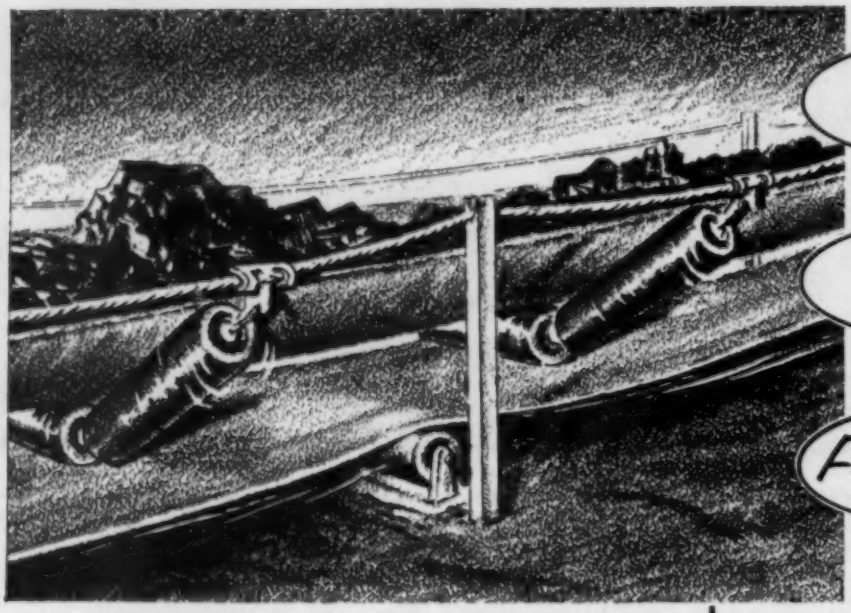
EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GOLD LINE SCANDURA

FOR COAL MINING



Tough

Strong

Fire Resistant

Acceptance designation "Fire-Resistant, U.S.B.M.No. 28-1" has been assigned to this belt.

More and more mines are using and reordering SCANDURA because:

GOLD LINE is completely Fire-Resistant

GOLD LINE uses mildew inhibitors and rot proof Nylon to assure *double* mildew and moisture protection

GOLD LINE resists abrasion and cover stripping better than conventional belting

GOLD LINE easily absorbs shock loads and impacts

GOLD LINE has a tensile strength substantially higher than conventional five ply belts.

"THE BEST OF THEM ALL"

Exclusive Distributors for the Mining Industry East of the Mississippi

National Mine Service Company

Suite 564, Alcoa Building, Pittsburgh 19, Pa.

All-State Div., Logan, W. Va. • Whiteman Div., Indiana, Pa. Morgantown, W. Va. • Ky.-Va. Div., Jenkins, Ky. • Western Ky. Div., Madisonville, Ky. • Ashland Div., Ashland, Ky. Anthracite Div., Forty Fort, Pa. • Bemeco Div., Beckley, W. Va. Clarkson Div., Nashville, Ill.

SCANDINAVIA BELTING COMPANY

Newark 1, N. J. PLANT: Charlotte, N. C.

TAKE ADVANTAGE OF YOUR "EXTRA MAN"

Your KENNAMETAL* Representative is a specialist in solving underground problems with Carbide Tooling

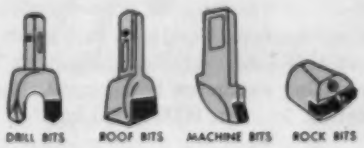
Your Kennametal Representative can help you with many of your mining problems. He has solved mining problems as a supervisor at the face. Also, he has been trained in the selection and use of the proper cemented carbide cutting and drilling tools. Chances are that during his years of field experience, he has encountered and helped solve the same problem facing you now.

A Kennametal Representative can help your personnel get top bit performance and the lowest possible bit cost by the proper use and reconditioning of Kennametal tools. Why not take advantage of this practical experience and technical training? Let your Kennametal Representative help you select the tool designed to give you long bit life, higher production, lower cost per ton. Why not give him a call? You'll find his name listed in the Classified Section of your Telephone Directory under "Mining." KENNAMETAL INC., Mining Tool Division, Bedford, Pennsylvania.

C-3078

*Trademark

INDUSTRY AND
KENNAMETAL
...Partners in Progress

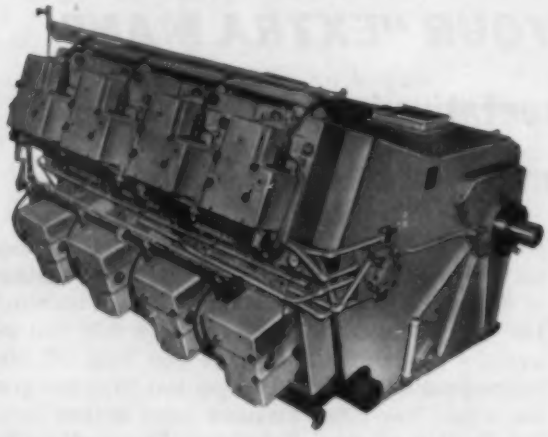


FOR **HIGH PRODUCTION** AND **LOWEST OPERATING** COSTS—

NOTHING equals the PAGE 700 SERIES SINGLE DECK WALKING DRAGLINE

3 models
5 to 15 cubic
yard capacities

Powered by the
DRAGLINE-PROVED PAGE HORIZONTAL V-TYPE DIESEL



The Page Engines powering 700 Series Draglines are designed specifically for dragline work . . . to work longer, at lower cost, with less downtime and maintenance than any other engine. Big bearings, big pistons, a short, stiff crankshaft and slow (450 RPM) speed are only part of the story of why many Page Diesels are still producing maximum horsepower after 20 years of operation. Bulletin WDSD-155 has full details.

Page 700 Series Draglines are rugged, compact, workhorse machines. They are designed and built with the fastest practical hoist and swing speed to reduce cycle time and increase yardage.

The Page 700 Series Dragline is proof that a fast, efficient, medium-sized machine will *consistently* outperform larger, but slower machines in virtually every kind of digging.

In addition, initial investment for a Page 700 Series Walking Dragline is considerably smaller, and operating and maintenance costs are lower. *Want more details? Write for Bulletin WDSD-155 today. There's no obligation.*

PAGE ENGINEERING COMPANY
CLEARING P. O.—CHICAGO 38

Page

Automatic Dragline Buckets
Walking Draglines

W-2001

If it's a PAGE... *It* DIGS

National Mine Service Company

New Convenience and Economy for users of

Clarkson* "Redbird" Conveyor Chain

Clarkson "Redbird" Conveyor Chain, standard of the industry for economy and durability, is now stocked and distributed in all major coal fields by National Mine Service Company. The regularly scheduled truck deliveries which established the National Mine reputation for service will now bring you Redbird chain—already assembled in lengths for convenient handling.

To gain maximum strength and balanced construction, Clarkson Redbird flights and flight pins are welded together—forming an integral unit. This type of construction also facilitates replacement, since it is necessary only to break the cottered chain and insert the new flight assembly. Longer chain life, reduced downtime, less adjustment and fewer replacements make Redbird the most economical chain available.

Your National Mine representative will be glad to show you how Clarkson Redbird can reduce your chain costs.

**Clarkson Manufacturing Co., now Clarkson Division of National Mine Service Company.*

National Mine Service Company

564 Alcoa Building • Pittsburgh 19, Pennsylvania

All-State Division Logan, W. Va.	Anthracite Division Forty Fort, Pa.	Ashland Division Ashland, Ky.	Bemeco Division Beckley, W. Va.	Clarkson Division Nashville, Ill.
Kentucky-Virginia Division Jenkins, Ky.	Western Kentucky Division Madisonville, Ky.	Whiteman Division Indiana, Pa.	Mountaineer Division Morgantown, W. Va.	

WIRE ROPE AT WORK

The Coaldale Mining Co., Coaldale, Pa., operates one of the region's best anthracite mines. The photograph above shows the headframe of No. 7 Shaft, with its four big bicycle sheaves and its sturdy steel ropes. Up the production compartments come heavy loads of coal, which are taken by rail to the rotary dump, then hauled up a plane to the breaker. No. 7 Shaft, now approximately 1100 ft deep, will handle some 3400 tons of coal and rock in an average day.

The capacity of the shaft cars is 4.9 tons. Lifting these loads is a job entrusted to Bethlehem wire rope, which is always specified in the Purple Strand grade. To insure the necessary combination of strength and fatigue-resistance, the ropes are supplied in the 1⅜-in. size with the popular 6 x 25 Type W construction.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

MINING • QUARRYING • CONSTRUCTION • EXCAVATING • PETROLEUM • LOGGING • MANUFACTURING

BETHLEHEM WIRE ROPE

BETHLEHEM STEEL

FULLER ROADRANGER® Transmission standard in new LeT-WesCo truck

Fuller's 9-speed R-1150 ROAD-RANGER Transmission was selected for the revolutionary new 30-ton LeTourneau-Westinghouse off-road hauler ". . . because of the wide range of gear selection and speeds, plus the fact that it shifts easily and quickly."

Merle R. Yontz, President, says: "We wanted a tough, fast, high-production hauler which would be cheaper to run, simpler to maintain, and easier to operate—one that would make more money per trip for its owners."

So, the LW-30 features the new Fuller R-1150 ROADRANGER Transmission, designed specifically for extremely heavy-duty off-highway service. Advantages:

- No gear splitting—9 selective gear ratios are evenly and progressively spaced
- Pre-selective countershaft brake for easier, quicker shifts
- Average 38% between ratios
- One shift lever controls all 9 forward and 2 reverse speeds
- Engines operate in peak hp range with greater fuel economy
- Less driver fatigue—1/3 less shifting than with comparable multi-speed transmissions
- Range shifts pre-selected—automatic and synchronized

Check with your local truck dealer for the *right* Fuller Transmission for your job.

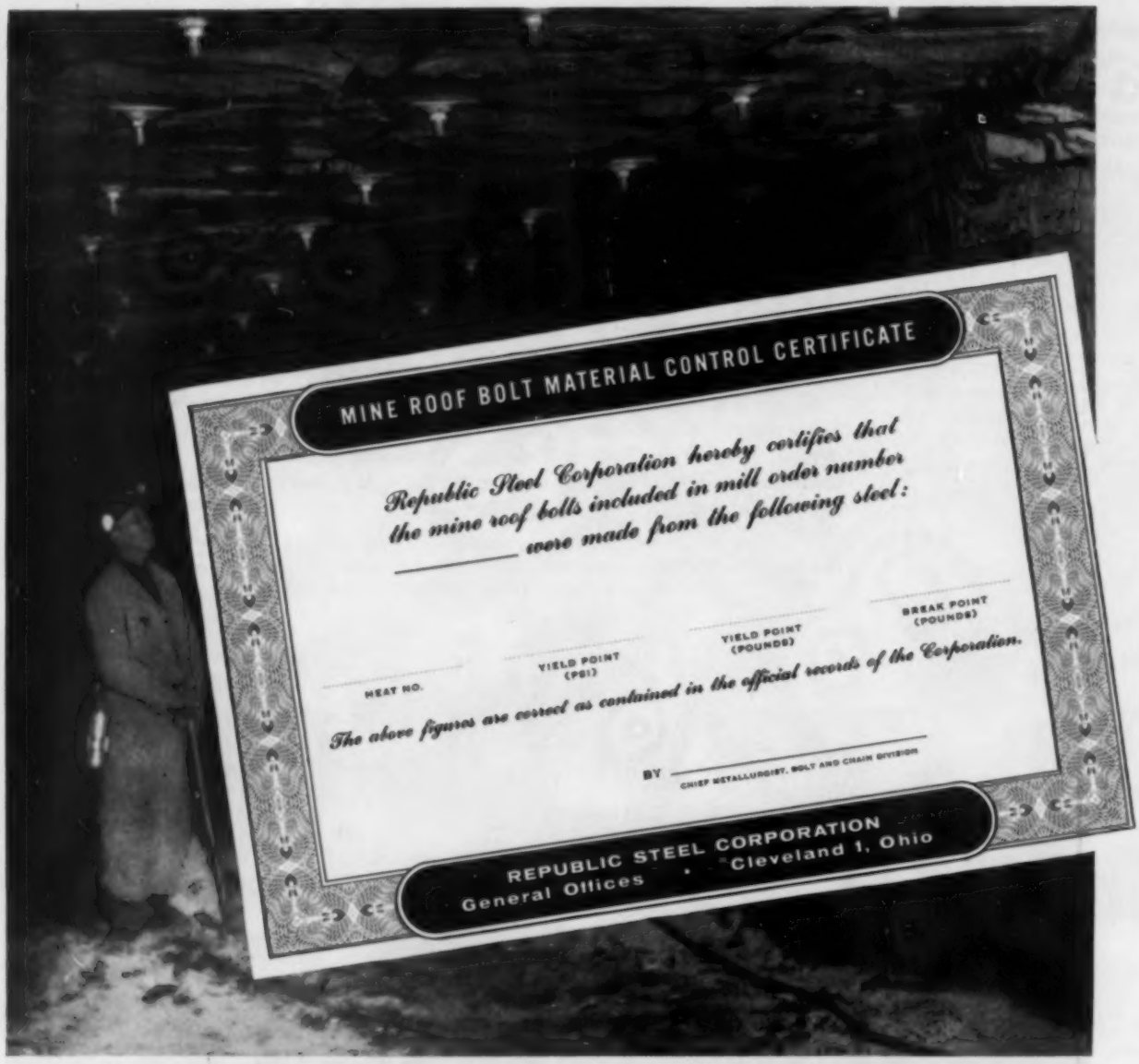
New LeT-WesCo LW-30 truck, powered by 375 hp Cummins 4-cycle, turbo-charged, V-8 engine, features Fuller 9-speed R-1150 ROADRANGER Transmission.

FULLER MANUFACTURING COMPANY, Transmission Division, Kalamazoo, Michigan • Unit Drop Forge Division, Milwaukee 1, Wisconsin • Shuler Axle Company, Louisville, Kentucky (Subsidiary) • Sales & Service, All Products, Western District Branch, Oakland 6, California and Southwest District Office, Tulsa 3, Oklahoma.

FULLER

TRANSMISSIONS

Specify Performance Certified


MINE ROOF BOLT MATERIAL CONTROL CERTIFICATE
Republic Steel Corporation hereby certifies that the mine roof bolts included in mill order number _____ were made from the following steel:
HEAT NO.
YIELD POINT (PSI)
YIELD POINT (POUNDS)
BREAK POINT (POUNDS)
The above figures are correct as contained in the official records of the Corporation.
BY
CHIEF METALLURGIST, BOLT AND CHAIN DIVISION
REPUBLIC STEEL CORPORATION
General Offices • Cleveland 1, Ohio

MINE ROOF BOLT MATERIAL CONTROL CERTIFICATE is individually filled out for each shipment of Republic Mine Roof Bolts. Information shows specific strength characteristics for the particular heat or heats of steel from which bolts were made. This exclusive Certification Program is your guarantee of consistent quality in Republic Mine Roof Bolts.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

Republic Roof Bolts

...your guarantee of dependable, top-holding strength

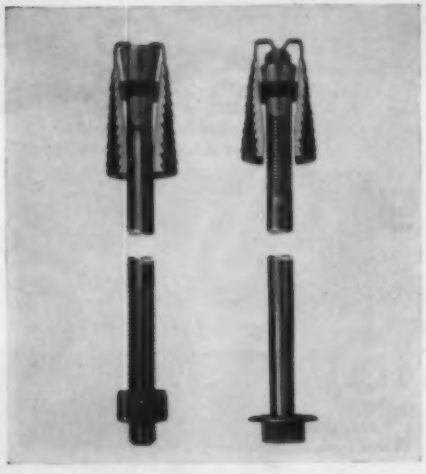
Here's real news for mine operators who want 100% assurance of dependable, high strength in every roof bolt installed. It's Republic's new Mine Roof Bolt Certification Program. Through this means, Republic, and only Republic, now furnishes positive evidence of the superior performance of every mine roof bolt shipped, based on actual tests. Here's how the program works:

First, as a basic steel producer, Republic is in complete control of every heat of steel used for Republic Roof Bolt manufacture. Chemistry is precisely regulated to provide required physical properties.

Next, prior to roof bolt production, samples of each heat are physically tested to destruction in the metallurgical laboratories of our Bolt and Chain Division. Complete data are compiled—including yield point in pounds per square inch, plus yield point and break point in pounds for the actual bolts produced.

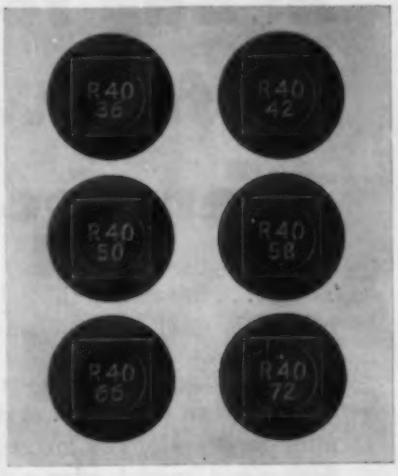
Finally, each heat is kept separate throughout manufacture, and final bolt bundles are numbered accordingly. On shipment, Republic furnishes a Mine Roof Bolt Material Control Certificate showing specific information on the particular heat or heats of steel from which the bolts were made. In every case, yield and break strengths are guaranteed to meet or exceed the physical requirements contained in Specification ASTMA-306, latest issue, as submitted by The Committee on Roof Action to the Industry as mining standards. Best of all, every Republic Mine Roof Bolt now produced is covered by the Certification Program, at absolutely *no extra cost* to you.

It will pay you to get all the facts on Republic's complete line of PERFORMANCE CERTIFIED Mine Roof Bolt Assemblies, designed to meet every overhead condition. Simply contact your local Republic office, or mail coupon.



OUTSTANDING PERFORMANCE of Republic Mine Roof Bolt Assemblies is exactly predicted by the new Certification Program. Republic offers all four major classifications of assemblies, plus technical assistance in selection and installation. Types shown are forged wedge head bolt and square head bolt with wedge head and rigid expansion shell.

POSITIVE IDENTIFICATION OF REPUBLIC ROOF BOLTS is forged into the head of each unit. "R" stands for Republic, numerals alongside indicate steel analysis, and the lower number shows length. Republic Roof Bolts are available from 36" to 72" long in standard sizes. Longer lengths can be provided on special order.



STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. C-4040A
3124 EAST 45TH STREET • CLEVELAND 27, OHIO

Please send me information on:
☐ Mine Roof Bolt Assemblies
☐ Material Control Certification Program

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

Ready to go on flow...with Thermocoal Belting

Bears U.S.B.M. acceptance designation #28-13.

Tough . . . fire-resistant . . . long-wearing, Thermocoal conveyor belting is used by profit-minded mine operators everywhere.

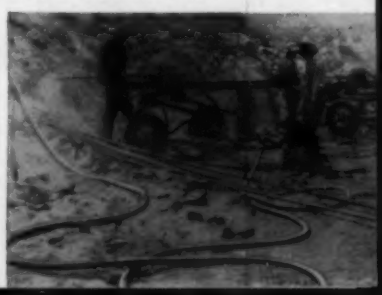
Here's belting that bears acceptance designation #28-13 of the U. S. Bureau of Mines . . . meets or exceeds all after-flame and after-glow tests. It's rugged belting, with high resistance to flexing and impact, edge wear, abrasion and mildew.

Specify construction of cotton, cotton-nylon or rayon duck. All are impregnated with specially compounded Thermoid rubber stocks for long, economical service.

Order Thermocoal Belting through your Thermoid distributor, or write direct for detailed information and data sheets.

Cut costs with Thermoid Multi V-Belts . . .

. . . and Thermoid Hose



Thermoid

Thermoid Company
Trenton, New Jersey
Nephi, Utah

NEW— for one-man mobile coal drilling...

LONG

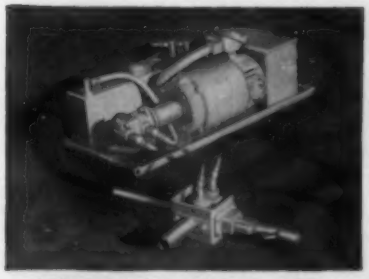
MOBILE HYDRAULIC COAL DRILLS

(USBM APPROVED)

In the 1-M-20 Drill, high pressure permits high horsepower and allows one man to do the work of expensive mounted drills.

Model No. 1-M-20 (one man, 20 pounds) Drill

Model No. 1-M-30 (one man, 30 pounds) Drill



SD-10 unit is designed for mounting on "T" trucks or mobile cutting machines.

The TD-10 can be used with a trailer for supply haulage or conveyor pan moving.

Completely new in principle, these LONG Mobile Coal Drills permit one man to do the work formerly requiring two men with bulky high-priced mounted drills. They're designed with their own hydraulic power units to work at 2000 psi, which permits a weight of only 20 pounds for the 1-M-20 (suitable for drilling all powder holes), and 30 pounds for the 1-M-30 (applicable for Airdox and Cardox holes).

In this new design, an intrinsically safe electric control circuit means the electric motor operates and oil circulates only when the auger is rotating. This spells more efficiency of both electric motor and hydraulic parts and permits a more compact unit because waste energy is not going into heat in the oil system when the auger is not operating. The independent hydraulic power unit avoids tampering with relief settings and provides the high pressure required for most efficient coal drilling.

LONG Hydraulic Drills are available as the TD-10 with self-tramming power unit, or as the SD-10 with power unit designed for mounting on "T" trucks and mobile cutting machines. Both the LONG 20-pound and 30-pound mobile drills can be used with either the TD-10 or SD-10, and can be quickly interchanged at the face.

For details or a demonstration, write...

The LONG Company
Oak Hill, W. Va.

PORTABLE

CABLE

IF IT CARRIES CURRENT KW CARRIES IT!

"TOUGHEST, MOST FLEXIBLE TRAILING CABLE WE'VE EVER USED IN OUR MINES"

Says General Superintendent

"In fact," says Mr. L. G. Bishop of De Bardeleben Coal Corp., "the KW Laytex® 'Kaiser Master' Trailing Cable undergoes the roughest service you can think of.

"Because of the low roof in our mine, many of our cutting and loading machines cannot carry a reel. That means the full length of the cable (over 400 feet) is dragged and yanked over rough, sharp-edged stones and through wet areas."

Flexibility helps prevent cracking, breaking

Mr. Bishop and his fellow officials of the mine also like the flexibility of KW "Kaiser Master" cable—*a stiffer cable would crack or break when pulled from its coil.*

"What's more," says Mr. Bishop, "KW's resistance to cuts and bruises helps to prevent short circuits. It's the smoke from short circuits that drives miners from their working areas.

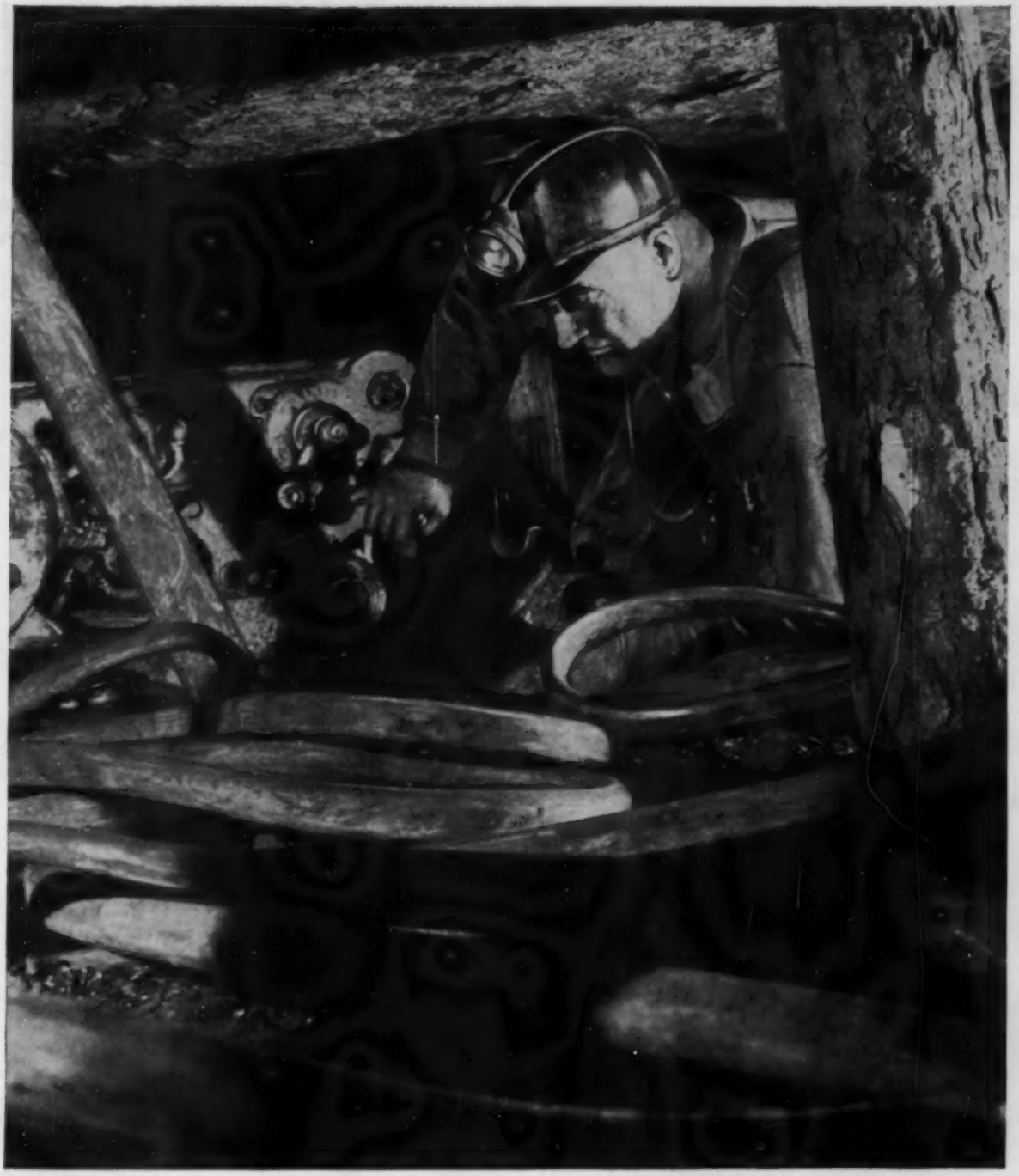
"That's one more reason why we plan to convert completely to KW 'Kaiser Master' Trailing Cables."

A KW representative will be glad to give you immediate service to your needs. Call the Kaiser Aluminum sales office or KW distributor listed in your telephone directory. Kaiser Aluminum & Chemical Sales, Inc., *Executive Office,* Kaiser Bldg., Oakland 12, Calif.; *General Sales Office,* Palmolive Bldg., Chicago 11, Illinois.

Tough—KW Portable Cable can take the punishment of being *repeatedly run over* by heavy equipment like this!

Dependable—KW cable stands up under this kind of treatment as *regular routine*—hauled, jerked and dragged over wet, rough mine floors.

Flexible—KW cables *go anywhere* in the mine . . . and whether on or off the reel, it's cable nobody has to "baby."



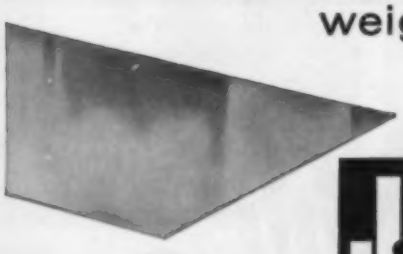
Here's an off-track coal-cutting machine being used in the mine's 23½-inch coal seam. The KW "Kaiser Master" Trailing Cable is pulled along behind it, since no reel can fit into this space.

Kaiser Aluminum

IF IT CARRIES CURRENT, KW CARRIES IT!

JALTEN low alloy high-strength J & L steel

provides equal strength with lighter weight



Jalten permits high design loads with reduction in section. Usual reduction is two gages with weight saving as much as 25%.

High strength of Jalten is the result of balanced chemical composition which is carefully controlled during production. Jalten's strength is retained through fabrication and welding without further heat treatment.

Jalten is available in the forms you require (plates, hot rolled sheets, hot rolled bars, small shapes and structurals). Jalten can be purchased in three grades to meet specific requirements for high strength, formability, impact, resistance to corrosion.

Your local distributor can supply you with information on Jalten, or you can write direct to the Jones & Laughlin Steel Corporation, Dept. 411, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

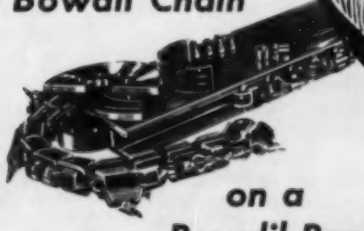
J&L STEEL

Jones & Laughlin

. . . a great name in steel

...this is the point ... where profits begin

All the more when used in a Bowdil Chain



on a Bowdil Bar

The Bowdil Company
CANTON, OHIO

...Delivers "More Use per Dollar"

You can't use a longer lasting, safer belt for hauling full loads in underground mining operations! Special cushioned strength members and resilient synthetic outer plies provide *double* compensation to give Ray-Man Conveyor Belt unusual flexibility. It trains naturally, troughs easily . . . handles *more* coal even where thick, narrow belts are used . . . or where small pulleys are required in low head-room installations. R/M's exclusive "XDC" Cover provides a degree of protection against wear, tear, cuts and abrasions never before possible! Ray-Man requires *no* breaker strip . . . yet it resists gouging and ripping, holds fasteners better than any other belt construction.

Like all Manhattan underground belts, Ray-Man is mildew-proof and moisture resistant, and available in R/M's special fire-resistant construction awarded Bureau of Mines' acceptance designation: "Fire-Resistant, U.S.B.M. No. 28-10." Ray-Man Conveyor Belt does a *better* job, *longer* . . . and it's *safer* to use!

Other Manhattan conveyor belts also offer special engineered features for long, trouble-free service. Ask an R/M representative about Homocord, extra-cushioned for unusually abusive shock loading . . . R/M Tension-Master, for extra long lifts and high tensions. For every job requirement, there's a Manhattan heavy duty conveyor belt to give you "More Use per Dollar." Write for descriptive bulletins.

More Dependable Mine Drives with R/M Poly-V®

This patented new concept in heavy duty drive transmission delivers up to 50% *more* power in the *same* space as ordinary V-belts . . . *equal* power in *less* space! It employs a *single*, V-ribbed belt . . . eliminates "matching" problems . . . cuts belt and sheave inventories to a new low! Write for a copy of Poly-V® Drive Bulletin #6638 *today!*

**Poly-V is a registered Raybestos-Manhattan trademark.*

RM-711

BELTS • HOSE • ROLL COVERINGS • TANK LININGS • INDUSTRIAL RUBBER SPECIALTIES

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls

HEAVY — RUGGED — POWERFUL

Auger at LOWEST Cost With a McCARTHY Coal Recovery Drill because...

1. **SELF-MOVING in any direction**
2. **2-MAN CREW for all augering**
3. **EASIER MAINTENANCE**

There's more profit in every ton of coal augered by a McCarthy coal recovery drill.

A McCarthy drill requires only two men to operate. It moves itself from hole to hole without the help of any extra men or equipment. It delivers more tonnage per horsepower than any other coal recovery drill.

A McCarthy drill stays on the job, producing more of the low-cost coal that means extra profit for you. Maintenance costs are lower too. McCarthy drills are designed and built by pioneers in coal recovery machines. They are heavy, rugged and powerful.

Write or phone for more information on McCarthy coal recovery drills.

Use McCarthy for More Profit from Every Ton

Manufacturer of Drilling Equipment Since 1901

MANUFACTURED BY

THE SALEM TOOL COMPANY

742 SOUTH ELLSWORTH AVE. • SALEM, OHIO, U. S. A.

SALEM

Leman "factory-authorized" repairs will put your equipment back to making profits in a hurry....

PROMPT REPAIR SERVICE PICK-UP RIGHT AT THE JOB OF DAMAGED OR WORN EQUIPMENT

Yes, even the heaviest mining machines and equipment are back on the job faster when Leman Machine Company does the repair work. A complete, modern machine plant and full staff of specialists enable Leman to assure you of prompt, efficient service that saves time and money.

The plant and equipment layout at Leman's is similar to the manufacturer's production line. There's no wasted motion to boost repair costs and you get workmanship equal to that of the original equipment producer.

LEADING IN MINING EQUIPMENT REPAIRS FOR OVER 35 YEARS

Authorized, recommended agency for repairing Jeffrey Equipment. Equipped to repair, rebuild or remodel all mobile loading and mining equipment and electric locomotives.

Long list of successful repair jobs includes Jeffrey, Joy, Goodman, Lee-Norse, Clarkson, Long, General Electric and Westinghouse mining equipment.

- Restore even heaviest equipment to original condition.
- Make modifications converting old machinery to latest models.
- Equipped to design new parts for specific requirements.
- Pickup and delivery right to job-site reduces down time of equipment.

Phone or write for prompt, courteous service on your repair needs.

LEMAN
MACHINE COMPANY

BOX 236 PORTAGE, PENNA. PHONE: PORTAGE 2051

Versatile worker for the Skyline Coal Co.

THIS NO. 955 TRAXCAVATOR* STEPPED UP PRODUCTION ABOUT 200 TONS A DAY!

BEFORE the Skyline Coal Co. put this CAT* No. 955 Traxcavator in its mine in Evanston, Kentucky, U. S. A., it had tried two other machines on the job. A rubber-tired loader couldn't stand the abuse of rough footing. A 'dozer couldn't maintain the production pace. The No. 955 stepped in and took charge—cleaning up spillage from the auger, clearing under the tipple, loading pit coal and loading spoil to put on roads.

Working three eight-hour shifts daily, five days a week, the No. 955 increased production by about 200 tons a day—or about 1,000 tons a week. Says Skyline's Superintendent Howard Farley: "I've run lots of loaders. For my money the No. 955 is the best a man can buy. Cost of operation is low. And it's built to take punishment."

Like all Caterpillar-built machines, the No. 955 Traxcavator is engineered for the *hard* work. For example, the frame is welded into a one-piece unit and solidly mounted on the track roller frames. Lift arms and cross braces are of box section construction, and bucket tilt arms are solid steel.

The No. 955 is engineered for *fast* work, too. It has quick-acting hydraulic controls—ample reach and dumping clearance. Bucket tilt and lift levers are positioned for easy one-hand operation. And 40-degree bucket tilt-back at ground level provides greater pry-out force and less spillage.

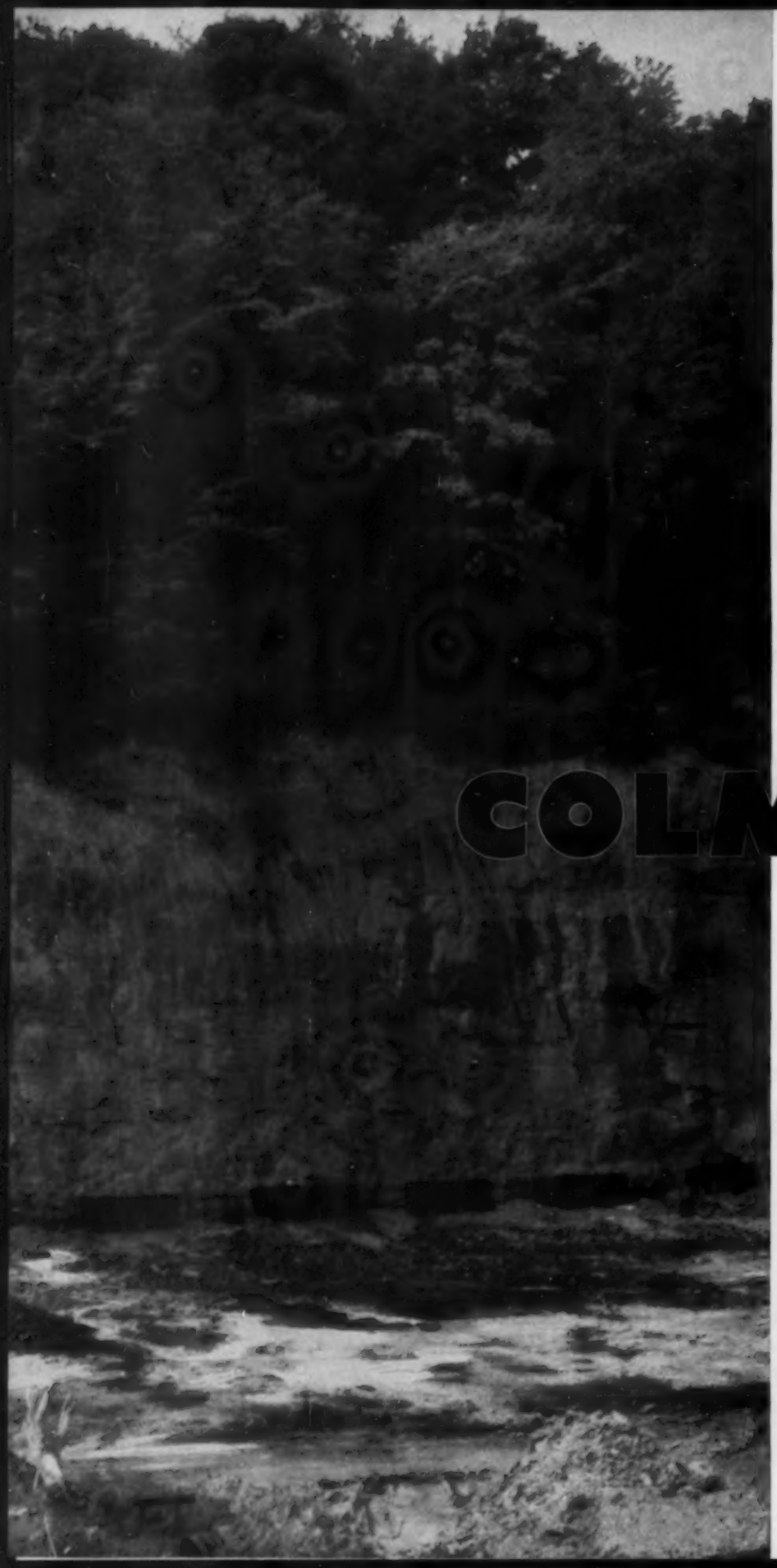
To match your job needs, there are two other versatile Cat-built Traxcavators besides the 1½ cu. yd., 70 HP No. 955. The smaller No. 933 (1 cu. yd., 50 HP) and the larger No. 977 (2¼ cu. yd., 100 HP) complete the line. Per pound of machine, each delivers more lift, faster lift and more production than any unit in its class. Ask your Caterpillar Dealer to show you how a Traxcavator can earn profits for you!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

WANTED— THE HARD WORK



Two operators spell each other during the Colmol's 1,000-foot, two-day travel into the mine.

COLMOL®

Ten minutes after starting this cut, the Colmol had completely disappeared into the 43" seam.

mines the highwall...

PEAK–827 TONS
AVERAGE–535 TONS
PER 8-HOUR SHIFT

Ten days' mining time is represented in the highwall operation pictured at extreme left. Just two days per opening is required for the Colmol to dig its way 1,000 feet underground . . . delivering an average 535 tons of coal per 8-hour shift.

"That Jeffrey machine is sure a bear for work . . . day after day without a complaint", say the superintendent and two operators of this Colmol. Our photographer had to work fast —ten minutes after the cutters attacked the face, the Colmol had dug itself out of sight under the highwall.

THE JEFFREY MANUFACTURING COMPANY • COLUMBUS 16, OHIO

JEFFREY

CONVEYING•PROCESSING•MINING EQUIPMENT...TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

RECORDS* PROVE

Twice the rope life

**Case histories show the proof. Yellow Strand Flattened Strand Wire Rope is making records of double the life, and even more, compared to round strand construction wire ropes. Ask your distributor, or write us for actual records on its performance.*

...with YELLOW STRAND Flattened Strand Wire Rope

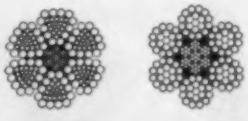
It has greater surface area! It has 10% greater strength! It's more crush resistant! It gives up to double, or more, the life of round strand rope! These are, briefly, the profitable advantages of Yellow Strand Flattened Strand on your dozers, scrapers, draglines, trench hoes and hoist lines.

And Yellow Strand Flattened Strand is "always on hand" at your nearby Broderick & Bascom distributor. You can depend on his specialized "know how" in recommending the right rope for your equipment. You can benefit by his prompt attention to your needs — backed by nationwide factory and warehouse stocks by B & B.

Specify Yellow Strand Flattened Strand on your next wire rope order and get the proof of lower overall costs and longer life. Ask your nearest B & B distributor, or write direct to us for more information on all your wire rope needs.

Here's Why Flattened Strand Lasts Longer

Compare Yellow Strand Flattened Strand with round strand wire rope (at right). In Flattened Strand you have twelve contact points, greater bearing area, smoother surface, less wear. Result: longer service, lower final cost.



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At a pit in Germany...

2 Rear-Dumps move 180 tons every hour over 1150 ft. of rough pit floor

At an important German quarry, south of the Ruhr, two Model C Tournapull® Rear-Dumps haul out about 180 tons of blasted limestone rock each working hour.

The German firm, Rheinisch-Westfallische Kalkwerke-Aktiengesellschaft, Dornap, is using these heavy-duty haulers in removing the top layer of a limestone hill at the company's Honnetal quarry. This quarry supplies lime to the chemical and construction industries, and to the steel mills of the Dortmund-Hagen area. Lime dust from this plant is also used in mines to control fires and explosions.

Body design withstands shock loads

A shovel loads the two Tournapulls (one with an earlier 18-ton capacity, the other a current 22-ton model) with large chunks of limestone. The Rear-Dumps' egg-shaped bowl design tends to safely deflect shocks of loading. According to extensive tests in this quarry, trucks with a box-shaped body could be loaded to only 70% of capacity, while Tournapulls were consistently loaded to 85% and 90% of capacity.

During typical operation, Rear-Dumps haul rock about 1150 feet over the rough pit floor. Each unit delivers about 90 tons hourly to a crushing plant, says Graduate Engineer Hettwer, Technical Manager of the quarry.

Tournapulls also haul out waste loam and clay from fissures in the rock. On the waste dump, Tournapulls' big, low-pressure tires and power-transfer differential (which channels more power to the drive wheel on firmer footing) provide ample flotation and traction for hauling across loose fill.

Maneuverability saves time

At times, other types of haul units have been used for transporting rock here. However, they were unable to turn within the narrow space between the pit wall and the shovel's power cable in order to position for loading. Consequently, a bridge had to be laid over the cable for them to drive across. In contrast, Tournapull Rear-Dumps, with their 90° kingpin power-steer, can turn easily in the cable-to-wall space, eliminating the time-robbing practice of having to lay, move, and maintain a plank crossing over the cable.

When you have heavy material to move, or when you must work in a confined space, you will want to know more about Tournapull Rear-Dumps: 11, 22, and 35-ton sizes. Write us for full information on LeTourneau-Westinghouse equipment.

CR-1386-Q-1

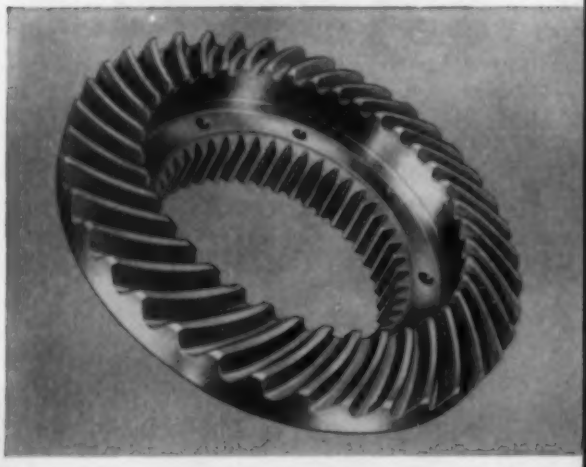
Despite the constant shocks of loading this heavy limestone rock, and of hauling over a rough, rocky surface for 16 hours daily, Tournapull Rear-Dumps have needed little repairs. One Tournapull has worked for more than 2¾ years; a second machine for longer than two years. Most months, Rear-Dumps' operating efficiency is over 90%.

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

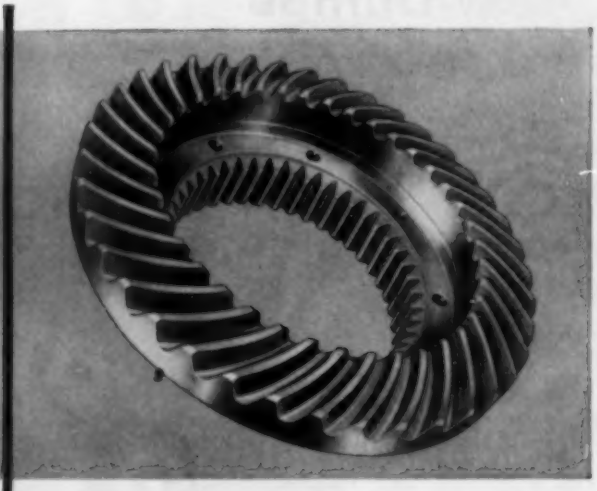
A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

They May Look Alike . . . but they're Not!



Replacement Ring-Gear
Made by Eaton—Axle Division



Replacement Ring-Gear
Not Made by Eaton

Only Genuine Eaton Axle Service Parts are Identical to the Original Production Components

Even Eaton Axle parts may wear out and require replacement. When this happens it is important that repairs be made with Genuine Eaton Axle Service Parts. They are identical to the original production components in design, metallurgy, heat treatment, and quality of finish—made to run together with the other axle parts. Eaton replacement parts are held to the rigid quality standards established for axle components and will deliver the same dependable, low-cost kind of service. So when, after thousands of miles of trouble-free operation, it may become necessary to replace worn parts in an Eaton Axle, it's most economical to make these replacements with Genuine Eaton Axle Service Parts.

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PRODUCTS: Engine Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Hydraulic Pumps Motor Truck Axles • Permanent Mold Gray Iron Castings • Forgings • Heater-Defroster Units • Automotive Air Conditioners Fastening Devices • Cold Drawn Steel • Stampings • Gears • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

◀Big rocks are moved easily and fast by 210 hp Tournatractor. When this job is done, fast-stepping tractor will highball to next shovel, traveling across or along tracks with no damage.

Roads and rails wind along steep, winding benches. Tournatractor's speed, and easy maneuverability are big time-savers in moving job-to-job. ▼

rubber-tired tractors end rail, crawler damage ...speed pit clean-up

At a major southwestern copper mine, four speedy 210 hp LeTourneau-Westinghouse Tournatractors® have solved a serious rail and crawler damage problem — and are paying their owners other substantial performance dividends.

The problem: ore blasting often buries sections of the more than 50 miles of railroad track in the pit. When crawler-type tractors had the job of dozing away debris, they regularly damaged ties, rails, and their own crawler tracks. Today, rubber-tired Tournatractors handle this assignment with *no* damage. Their wide, low-pressure tires flex harmlessly while rolling over track installations... never throw rails out of alignment... never block switches, or chamfer ties.

Faster shovel-to-shovel travel

Superintendents at the mine report that, in addition to solving this problem, Tournatractors have demonstrated two other important work assets: faster job-to-job travel speed, and unusual ability to work economically in rocky material.

Speed on travel between assignments is particularly important on this operation, because major task of Tournatractors is cleaning up around shovels spotted all along maze of over 150 miles of roads built on steep, winding benches. Tournatractor, with 2 to 3 times the speed of crawlers, produces major savings in work and travel time... gets more work done per day.

Less maintenance cost... less downtime

Tractor repair bills have also been cut, because tire-cushioned Tournatractors work over rocky surfaces without abrasion and shock damage. Crawlers, on the other hand, were a continual problem because of breakage and wear from rocks and grit in their track assemblies. Tournatractor's anti-friction drive is sealed, enclosed in rugged steel housings. Rocks and grit are sealed out, can't clog gears and rollers.

Maintenance of rubber-tired tractors has been easy, fast, economical. Operators report, for instance, that lube time is only one-third that needed for crawlers. These big LeTourneau-Westinghouse units are working long hours, too... one unit works 3 shifts a day, 7 days a week. Two others work 2 shifts a day. Downtime has been low. Strong, simple construction keeps Tournatractors working longer hours without breakdown.

Look into the money-making advantages of rugged, high-speed, rubber-tired LeTourneau-Westinghouse equipment in *your* operation. We'll furnish full details and arrange a working demonstration.

CT-1484-MQ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Loaded and ready for profitable blasting

PRIMACORD®
DETONATING FUSE

This hole could be one in a thousand, ready to "go" when *you're* ready to go — but not before. It is primed with Primacord, the detonating fuse which is resistant to sparks, friction, ordinary shock, stray electrical currents . . . . Even a direct hit by lightning failed to detonate it!

But a single detonator, attached to the end of the trunk line, will detonate this hole and all other holes in the hook-up. You'll get a blast you'll be proud of!

THE ENSIGN-BICKFORD COMPANY
Simsbury, Connecticut • Since 1836
Primacord® and Detacord® Detonating Fuse, Safety Fuse, Ignitacord®, Quarrycord, Pyrotechnical Devices and Blasting Accessories.

The square knot is used only above ground, to lengthen a trunk line of Plain or Reinforced Primacord or to tie in Primacord M S Connectors. It must be drawn up tight.

Plain Primacord Trunk Line — Used also for shallow holes — wherever resistance to abrasion and cutting is not required. Textile covered, flexible, resilient, with a "tacky," non-slip surface. Tensile strength 140 lbs. 1000-ft. spool weighs 17 lbs.

Reinforced Primacord Branch Line — recommended for deep holes where normal strength and resistance to abrasion and cutting are needed. Textile reinforced (yellow with red thread), tough, resilient, flexible. Tensile strength 170 lbs. 1000-ft. spool weighs 18 lbs. The knot shown is the double-wrap half hitch, made in the branch line and drawn tightly around the trunk line.

Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

OCTOBER, 1957

IVAN A. GIVEN, EDITOR

Big Lift

JUST HOW the railroad will ultimately fit into the land transportation picture in the United States—and elsewhere—is yet to be determined. Perhaps the matter never will be completely settled in the sense that the railroads will have a certain share of certain types of transportation forever. Situations seldom remain static for long and therefore the rail freight picture will continue to be one of change and evolution.

Now, a request for another freight increase by the railroads is being forecast. However, they are not alone in their desire for greater revenue, since the water carriers also have indicated that they must have more money. Their proposed rate hike, however, is only a fraction of what the railroads and the truck lines have asked for and received. But since the labor involved in shipping by water or pipe line is considerably less, sheer economic pressure generated by wage rises will tend to result in more traffic being diverted to waterways and, in the relatively near future, pipe lines—both of course, where practicable. The railroads, nevertheless, will be a major factor in coal transportation for a long time to come. If they can find some way of avoiding further coal rate increases, and perhaps even to cut some rates where critical coal tonnages are involved, they can assure a larger share of the mine-to-market flow while giving coal a real lift.

Eyes West

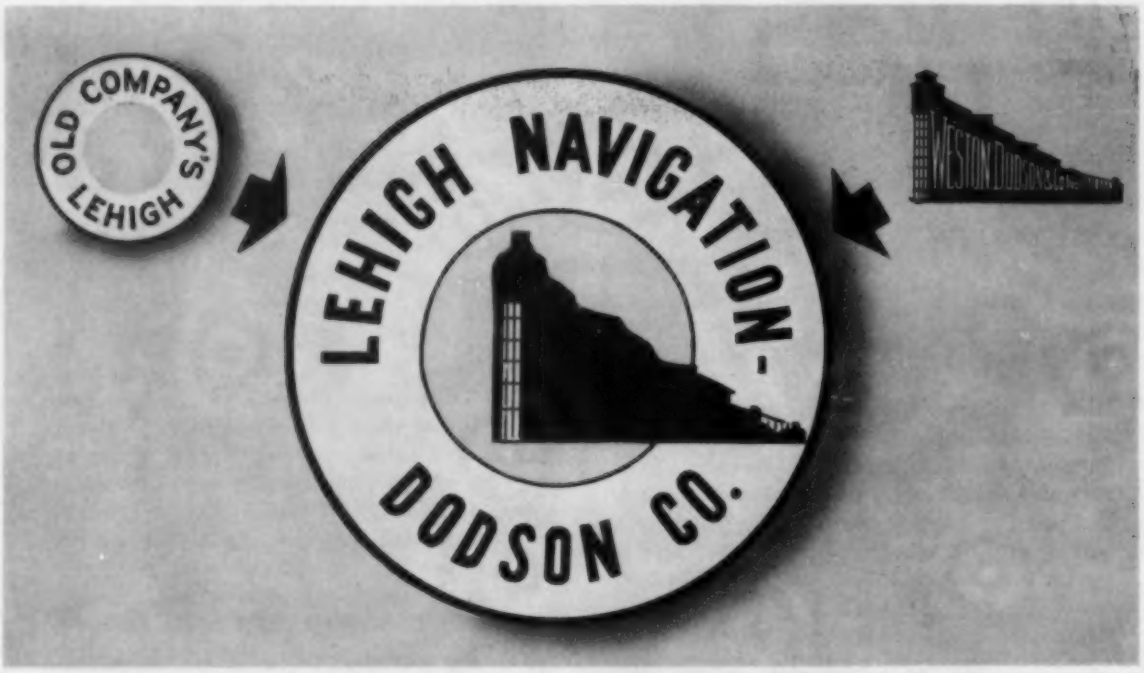
A CARBON DEFICIT, as well as a scarcity of certain chemicals in certain areas, distinguishes the present stage of economic development in the Rocky Mountain and Pacific Coast areas of the United States. Metallurgical-grade coke to fuel the increasing number of iron furnaces is one outstanding need, which is being reflected in active exploration for and development of suitable coal deposits. Phosphate, copper and other furnaces are new contenders for the available supply of carbon, whether from petroleum coke, Gilsonite, coal coke or coal char. On the by-product side, creosote is a scarce article in certain areas, as is tar for certain applications—roofing compounds, for example. And as one added starter there is the possibility of direct reduction of certain iron-ore deposits in one of the new processes involving carbon, the logical source of which is coal char. Another is gasoline, which might be an economically feasible product under certain local competitive conditions.

Perhaps it would be stretching things to intimate that the Far West might be the cradle of a new chemicals-from-coal industry. Other areas also are in the picture, but projects and plans already announced, as well as others under wraps, indicate that the West may well be in the race for the honor. The interest and participation of the oil companies is one of the more-encouraging factors. Husky, for example, is joining with Union Pacific in exploring the possibilities of a coal-conversion plant at Rock Springs, Wyo. At this point, the word might well be: Eyes on the West.

Key Man

FOR SOLID ACHIEVEMENT with a minimum of fanfare, the Mining Electro-Mechanical Maintenance Association, otherwise ME-MMA, deserves much more recognition than it perhaps has been accorded. Now five years old, its growth has made it a major factor in maintenance progress in Pennsylvania, Ohio, West Virginia and Virginia, and the undeniable advantages of its program has resulted in active interest in the formation of additional chapters as far west as Utah.

One 1957 step will be selection of the "Maintenance Man of the Year" from five designated as branch men of the year. Since he was yet to be announced, his name could not be included in this editorial. But this does not lessen the force of the reminder of the importance of maintenance in these days of machine mining. The maintenance man is definitely a key man in today's scheme of things, and ME-MMA is set up to make his contributions more effective. More support and participation can add to that effectiveness.



NEW TRADEMARK blends Lehigh Coal & Navigation's familiar red bull's-eye with Weston Dodson's traditional colliery emblem.

The Lehigh Navigation-Dodson Story

By merging Oct. 1, Lehigh Navigation Coal Sales and Weston Dodson have combined 237 yr of rugged experience in mining and selling coal. Both firms are rich in anthracite history. Both have long shared sound business codes.

By W. A. Raleigh, Jr.
Assistant Editor, COAL AGE

HOW CAN A COAL COMPANY grow to the top of its business and maintain stability through decades of wars, depressions, severe strikes and a catyclysmic drop in demand for its principal product?

Ask the question of Lehigh Navigation-Dodson Co., shippers of anthracite coals, Bethlehem, Pa. The firm—newly formed Oct. 1 through the merger of Lehigh Navigation Coal Sales Co. and Weston Dodson & Co., Inc.—would give you these answers:

1. Start off with and hold to a sound business philosophy.
2. Coordinate mining and sales strategy to meet the demands of market trends.
3. Save for the "rainy day" and be prepared to diversify operations and make other bold adjustments when the chips are down.
4. Adopt a comprehensive, long-range sales plan based on product quality and customer service.
5. Strive to give each employee in the office or mine a feeling of security and of belonging to the team.
6. Have unrelenting faith in coal's basic importance to the economy.

At this point, one might logically ask another question: How can a "new baby" in the industry speak with such authority? The answers are:

1. Except in name, the tag "new baby" could hardly be more of a misnomer. Both pre-merger concerns are steeped deeply in the origin, development and traditions of the anthracite industry.

2. Both have risen to and now hold top sales tonnage positions. In 1956, LNCS sold 1,750,000 tons of anthracite; Weston Dodson marketed 950,000 tons of anthracite and 280,000 tons of bituminous. This year, the two firms—now merged as Lehigh Navigation-Dodson Co.—expect to merchandise 2,450,000 tons of anthracite (about 10% of the total market). The parent company, Lehigh Coal & Navigation, will also sell about 1,500,000 tons of soft coal through its new bituminous coal sales subsidiary, Lehigh-Boone Bituminous Corp.

3. Both have successfully run the gamut of the worst that can happen to any business or industry.

For example, when Lehigh Coal & Navigation Co. was forced, because of severe labor problems, to close its Panther Valley Mines June 30, 1954, many in the industry predicted "curtains" for the company's sales future. However, by Oct. 1, 1954, LCN had 70% of its mining properties back in full operation under lessee arrangement with independent Panther Valley and Coaldale Mining Cos. The upshot: the firm's historic sales position (8 to 10% of total industry tonnage) was soon almost completely recovered, thanks to the combined hold-the-line

efforts of LCN's sales force and those of Weston Dodson—at that time an independent marketing affiliate.

Particularly notable in Weston Dodson's record as an independent is this fact. During 1924-56 when total anthracite commercial tonnage dove from 87 to 28 million tons, Weston Dodson exceeded its 1924 share of total industry sales in 24 of the 33 yr. Meanwhile, all independents averaged higher sales for only 13 of the 33 yr; the total industry and all line companies averaged lower sales every year.

Strength during adversity has truly characterized the sales records of both pre-merger companies. But each points with special pride to its continuity of successful operation, growth and progress without major reshufflings in its management setup. LNCS (and its counterparts of previous generations) has known this continuity for 137 yr—from Lehigh Coal & Navigation Co.'s 1820 charter date to the present. Weston Dodson's record dates back 100 yr to 1857.

Each pre-merger concern points with still more pride to its new corporate entity, Lehigh Navigation-Dodson Co. By combining 237 yr of production and marketing experience, company officials figure they will have a sales force able to cope more effectively than ever with the toughest competition inside and outside the industry.

Behind this consolidated (but unreduced) sales force are men with vision, guts and faith who have clung steadfastly to the legacy of sound business philosophy briefed above, which they have inherited from their forbears. Highlights of how this philosophy is practiced today—and was applied through the generations by the Lehigh Coal & Navigation and Weston Dodson companies—are presented in the following.

The Lehigh Navigation Story

Lehigh Navigation: 137 Yr Of Faith in Anthracite

The story of Lehigh Navigation is the story of the firm's 137 yr of unyielding faith in coal's basic importance to the economy. Because of this faith, the company well-merits its position as the father of the commercial anthracite industry, the builder of the Lehigh Valley and the country's third largest anthracite producer. It also stands today as one of the Nation's largest anthracite and bituminous mining and selling concerns and as one of America s most progressive, diversified business enterprises.

Although the "Old Company" finds formal origin in its 1820 charter date, its ultimate beginnings go back some 30 yr earlier. On a certain day in 1791, Philip Ginder, searching for game, roved nearby the upper Lehigh River in what is now called the Panther Valley. He stumbled and nearly fell over an unusual kind of hard black rock.

Shortly thereafter, Ginder took the rock to his friend, Colonel Jacob Weiss. With the help of associates in Philadelphia—Michael Hillegas, the first treasurer of the United States and Charles Gist, a well-known printer—Col. Weiss positively identified the rock as hard coal. As a result, the trio of pioneers and some others, early in 1793, formed the country's first anthracite mining company—the unincorporated Lehigh Coal Mine Co.—and initiated the huge job of developing Panther Valley's millions of tons of anthracite. The job of developing eastern Pennsylvania's southern fields—one of the world's richest and most extensive hard coal deposits—was huge because anthracite usage at the time was negligible. Further, the even more formidable job of getting the coal from mine to market was well-nigh impossible.

During the next two decades, the Weiss group and other LCM lessees made a fair amount of progress in acquainting consumers with the advantages of anthracite. "From time to time, Weiss would fill his saddlebags with coal and would range the neighborhood, leaving samples with the blacksmiths, urging them to try it in their forges. Another method of introducing the fuel was to give it away to enterprising men if they would come in and mine it for themselves. The company even supplied them with timber for building boats and rafts on which to float the coal down the (Lehigh) river."

In spite of this progress, it was not until Josiah White entered the picture in 1817 that the transport problem was solved and the Panther Valley project was rescued from shaky foundations. For his stout contribution, Josiah White became known as the founder of the Lehigh Coal & Navigation Co. and the builder of the Lehigh Valley.

In 1818, Josiah White, Erskine Hazard and George Hauto leased the Lehigh Coal Mine Co.'s lands. They immediately plunged into the task of opening the Lehigh River to coal transport. Exploration and survey of the river the same year led to the formation of the Lehigh Navigation Co. (to build the canal) and to the reorganization of the Lehigh Coal Mine Co. Then, on April 21, 1820, the two companies merged into the Lehigh Navigation & Coal Co., which was incorporated 2 yr later as the Lehigh Coal & Navigation Co. The Lehigh Canal, begun in 1827, was finished 2 yr later, connecting the Mauch Chunk Region of Panther Valley with Easton, Pa., and the Delaware Canal which (when completed in 1832) provided a connecting link to Philadelphia markets.

During the same period (1827), Josiah White built the Switchback R. R.—the country's first of commercial importance—from LCN's Summit Hill mines to the canal at Mauch Chunk. The gravity-operated railroad brought 6- to 14-car trains down 1,000 ft to Mauch Chunk and then returned them by mule-power to the summit.

Thanks to the vision and mechanical ingenuity of Josiah White and his associates, LCN was able in ensuing years to grow with the rapidly expanding anthracite industry. In 1818, the Lehigh Coal Mine Co. sold a mere 365 tons. By 1832, this figure had risen to 70,000 tons and, by 1846 had jumped to 500,000 tons.

A Company Tradition: Strength in Adversity

Before reaching its impressive 1846 tonnage, LCN's indomitable faith in coal first had to run successfully the test of adversity.

"In January, 1841, the Lehigh Coal & Navigation Co. met with a near-fatal disaster. That month a terrible flood, the worst anyone in the region had ever seen, devastated the Lehigh Valley. Dams and locks in the canal were washed out, bridges were wrecked, and lumber and other valuable property were carried away. It was obvious that no coal could be shipped to market for months, and that several hundred thousand dollars were needed to make necessary repairs."

In this crisis, Josiah White, now 60 yr old and retired, was called back to take command of "an almost hopeless situation. . . . Most of the stockholders had no more money to put in the company and those who had funds were afraid to invest them . . ."

Through White's leadership, the company decided to raise the neces-

Preserving 237 Yr of Faith in Coal's

C. MILLARD DODSON became president of the parent Lehigh Coal & Navigation Co. in April, 1954, after 3 mo as its executive vice president. Previously, he spent 15 yr with Weston Dodson Co., serving as president since 1946. Millard led LCN through the trying 1954 period when severe labor troubles put the firm on the brink of disaster. Similarly, when Weston Dodson's president, he directed that firm through critical competitive and coal supply problems.

H. LOUIS THOMPSON is executive vice president of the parent Lehigh Coal & Navigation Co. and a member of its Board of Managers. He has held the offices, successively, of assistant comptroller, comptroller, secretary, vice president and treasurer since coming with the company in 1951. He formerly was treasurer of the Sterling Seal Co., Erie, Pa., and has also been associated with the General Electric Co. Mr. Thompson graduated from Lehigh University.

EVAN J. THOMAS has served as vice president-sales of the parent Lehigh Coal & Navigation Co. since April of this year. Lehigh Navigation Coal Sales Co. had him previously as president, executive vice president and sales manager. He was formerly associated with D. L. & W. Coal Co., Susquehanna Collieries Co. and Continental Coal Co. Mr. Thomas started in the mines as a teenage boy and both his father and grandfather were coal miners.

sary $600,000 by mortgaging all its properties. The canal was repaired. Subsequently, the firm's pioneering in the use of anthracite as a blast-furance fuel paid off and tonnage rose to the 500,000-ton mark of 1846.

Still higher pinnacles of success characterized the Old Company's progress as it prospered with the total industry. Tonnage reached a peak of 8,000,000 tons in 1917. Even after World War II, when competitive fuels had made sharp inroads into anthracite markets, LCN held its share of industry sales which in 1952 meant about 3,500,000 tons. Soon, however, the firm was to run smack up against another near-fatal disaster.

"A combination of inadequate price return, high idle-day costs and low productivity caused severe losses." Mine workers refused to accept a "work harder, produce more" plan proposed by C. Millard Dodson who had been elected the company's new president, April, 1954. The firm then saw fit to formally close its Panther Valley mines shortly thereafter, on June 30, 1954.

Unyielding faith in its future came into play once again for the company. Assuming that smaller operators might want to lease the coal properties, LCN kept its mines in standby condition at a monthly cost of $135,000.

The assumption proved correct. In September, 1954, the Panther Valley Coal Co., Inc., leased a section of LCN properties and the Coaldale Mining Co. leased another section in November. These independents put 70% of LCN's total properties back into operation with commitments to market their tonnage through the lessor and Weston Dodson—at that time an independent marketing affiliate.

Meanwhile, LCN was faced with the prospect of losing its host of dealers. But a tradition of service and a high quality product, shared by LCN and Weston Dodson, saved the day. Lehigh Navigation Coal Sales (formed about the time the mining subsidiary, Lehigh Navigation Coal Co., ceased operations) and Weston Dodson kept most of the dealers in the fold. Result: LCN's historic sales position (8 to 10% of total industry tonnage) was soon almost completely recovered.

Past Experiences: Guide to the Future

A firm must have unyielding faith in its product to surmount the trials of adversity. And, where the firm is tough and smart, the scars of the past act as spurs to a stronger future. For LCN, this has meant an ever-expanding diversification progam which dates back to the building of the Lehigh Canal and the Switchback Railroad.

Today, integration and expansion have emerged as hallmarks of LCN's operations. With total assets of $67 million, the company's holdings include anthracite and bituminous coal lands, mining and marketing properties; a railroad (the wholly-owned Lehigh and New England R. R.); a shipping company (Penn Navigation Co.); real estate and a resort lodge in the Pocono Mts.

The formation this month of Lehigh Navigation-Dodson Co., coupled with the acquisition last March of the Boone County Coal Corp., Sharples, W. Va., makes LCN one of the country's largest anthracite and bituminous

JOHN E. DODSON is vice president in-charge-of-production of the parent Lehigh Coal & Navigation Co. He moved to the post May 1 of this year, after more than 3 yr as Weston Dodson's president and about 5 yr as its vice president in-charge-of production. He came to Weston Dodson in 1949 from executive job with a producing subsidiary, Locust Coal Co., Shenandoah, Pa. John has had 14 yr experience in management phases of mining.

CHARLES W. DILLEY heads up the newly formed Lehigh Navigation-Dodson Co. as president. He had been president, Lehigh Navigation Coal Sales since April of this year and, previously, was its vice president and sales manager. Mr. Dilley has been with the parent Lehigh Coal & Navigation Co. for 20 yr, starting in 1937 as New York district sales manager. He was formerly with the Central Railroad of New Jersey, coal traffic department.

TRUMAN DODSON, on Oct. 1, 1957, became vice president of Lehigh-Boone Bituminous Corp., the bituminous coal sales subsidiary of the parent Lehigh Coal & Navigation Co. From May 1 to Oct. 1 this year, he was Weston Dodson's president, having stepped up from sales executive jobs with the firm. Previously, Truman spent several years as special representative of the Anthracite Institute, specializing in automatic heating problems.

Basic Importance to the Economy

mining and selling concerns. Anthracite sales are expected to reach 2,450,000 tons in 1957. Through the newly formed bituminous coal sales subsidiary, Lehigh-Boone Bituminous Corp. LCN will merchandise about 1,500,000 tons of soft coal from Boone County and other properties.

The Weston Dodson Story

Business Begins: Product Quality the Cornerstone

Several years before the Civil War, Weston Dodson, unhappy about his success as a farmer, went to Freemansburg, Pa. (3 mi from Bethlehem) and took up the selling of coal for a Mr. Cartwright. Shortly thereafter—"sometime during March, 1857"—Weston went formally into business as a coal wholesaler.

Working from a small frame office alongside the Lehigh Canal at Freemansburg, the founder brought anthracite down via the canal from the Mauch Chunk region (25 mi nw of Bethlehem). From Freemansburg, the coal was routed via the canal to Philadelphia and New York markets for use in home heating, smithing, gun factories, etc.

Then as now, the cost of transporting coal to market often made the difference between winning and losing customers. And here Weston's new enterprise, primarily dependent on canal transportation, had to meet stiff competition from several large companies owning railroads. His adjustment took shape in a business code religiously practiced by all his successors:

"A guarantee and pledge to the coal consuming public to maintain the highest standards of preparation and quality at all times."

With product quality as the cornerstone for his enterprise, Weston carved out a fair chunk of initial business—about 200,000 tons a year. Total industry sales were running about 8,000,000 tons annually.

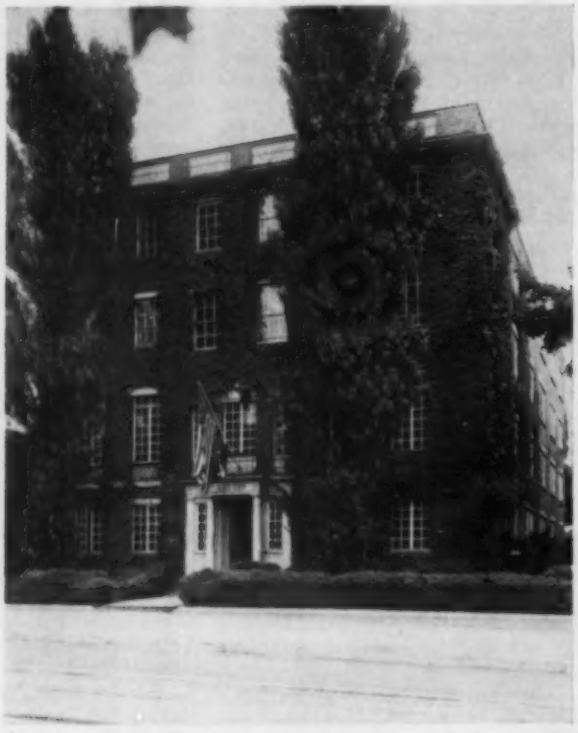
"Weston Dodson moved to Bethlehem in 1859 and continued alone in business until 1867, when he and his brother, Charles, organized the firm of Weston Dodson & Brother. They were joined by a third brother, Truman, in 1871 and formed the partnership of Weston Dodson & Co."

By this time, anthracite was fast taking hold as a home heating fuel. The Dodson brothers visualized rapid industry growth. But this growth must have exceeded even their fondest expectations. Anthracite tonnage soared from 14,000,000 tons in 1870 to a peak of 100,000,000 tons in 1917.

Alert to the bullish market trend, the firm decided the time (about 1871) was ripe to start its first anthracite mining venture in the Shenandoah Valley, Schuylkill County, Pa. Sales from wholesale and mining operations soon rose to the 400,000 to 500,000 ton annual level.

During the years that followed, ex-

STARTING A FAMILY SAGA, Weston Dodson opened for business 100 yr ago as a coal wholesaler in the small building above left. He lived at the inn above right. Buildings stand today along the Lehigh Canal, Freemansburg, Pa., just east of Bethlehem.



LEHIGH NAVIGATION-DODSON CO. now has headquarters in structure (left) built in 1919 at 528 N. New St., Bethlehem, Pa.

pansion continued and new mines were opened. A 1902 Dodson Calendar lists 12 shipping wharves and 16 collieries. Production came from both northern and southern anthracite fields from which it was transported by combined mule- and steam-power railroads to transshipping points.

"Weston Dodson died in January, 1889. Thirteen years later (1902) the company was incorporated, with Truman as its first president, followed by Charles. By this time, the organization was also engaged in the mining and shipping of bituminous coal."

When the Chips Are Down: Act Boldly

On the crest of prosperity, anthracite in 1902 suffered its severest strike. Industry output that year—halted for 165 days—plummeted from the previous year's 67,000,000 tons to 41,000,000 tons.

The Dodsons met the crisis head on by expanding bituminous operations. Soft coal properties were bought in Garret County, Md., and in Central Pennsylvania. The company also set up bituminous offices in West Virginia.

Expanded bituminous operations meant a major diversification effort and entrance into the industrial market mostly involving sales to the metallurgical trade.

Anthracite production recovered in 1903, bouncing back to 75,000,000 tons. Weston Dodson's fortunes spiraled upward. In 1920, the company recorded its peak year of combined anthracite and bituminous output—3,000,000 tons (1,500,000 tons of anthracite; 1,500,000 tons of bituminous). The biggest year for anthracite alone was 1942—2,260,000 tons.

Especially notable among other major crises was the one which faced the firm early in 1954. With its own mining properties fast drying up, the company was badly in need of a permanent source of coal supply. To solve this crisis, Weston Dodson negotiated a tie-in with Lehigh Coal Navigation.

The alliance—not a merger at this time—became a "marriage of convenience" between marketing and production interests. LCN reaped the benefit of Weston Dodson's host of customers and topnotch merchandising structure. On the other hand, Weston Dodson gained marketing rights to 200,000,000 to 300,000,000 tons of LCN-owned rich recoverable reserves in the southern anthracite fields of Panther Valley.

Employee Relations: Keep Close Touch

During the peak period of its mining activities (1915-35), Weston Dodson had about 1,000 employees on its payroll. Since the firm of pre-merger time was no longer directly engaged in mining, its staff numbered some 60 men and women. Dominant at either staff level, however, has been the close personal touch kept by top management with all personnel.

For example, Truman M. and Charles M., presidents, respectively, from 1902-08 and 1908-17, kept close touch with personnel needs and problems by living at the mines with miners. Such efforts brought payoffs too. Major localized labor difficulties and mine disasters—quite prevalent throughout the industry—always seemed to escape the Dodson organization. And recognition for safety achievement came in 1926 when the company was awarded the new James A. Holmes safety award for mining a million tons without a fatality.

Another acid test for personnel treatment came with the '29 crash and depression which brought layoff reverberations throughout the industry. Many firms, less provident, discharged employees right and left to maintain going-power. Dodson, however, with reserves built up for the "rainy day," asked its employees to take pay cuts but kept the staff intact throughout the entire depression.

Customer Relations: Give Total Service

The same spirit extended to Dodson personnel found its counterpart outside the company in total service to dealers and customers.

Important to both dealers and customers has been the firm's emphasis on selling a high quality product. As noted earlier, this policy was first set up by the founder who figured that it was the best bet for meeting competitive advantages held by larger companies.

Although practiced from earliest days, guaranteed high quality coal was formalized when the company formed a research department in 1919. Initially set up to solve preparation problems, this department received wide recognition in both hard and soft coal industries for its work in coal research and utilization.

The Dodson firm pioneered in promoting regular inspection of prepared coal at the mines, and in 1925 trained 45 coal inspectors for 30 different anthracite collieries. Over the years much time was spent in training Dodson salesmen recruits in coal inspection and analysis methods.

With product quality as the cornerstone, Dodson service to dealers (and through them to customers) was expanded to include:

1. Investigating customer complaints to dealers.

2. Giving engineering aid for the installation of domestic and industrial heating equipment.

3 Providing office administrative aids such as accounts receivable analysis, depreciation schedules and inventory calculations.

4. Issuing weather studies and degree day statistics for communities throughout the anthracite-burning area. (Dodson introduced the practice to anthracite in 1929.)

5. Publishing a one-page weekly bulletin which covers subjects running the gamut of coal trade interest. On Oct. 1, the 1,349th consecutive issue of the bulletin was scheduled for distribution to 4,000 Lehigh-Dodson accounts and friends. The bulletin will continue under the new masthead of Lehigh Navigation-Dodson Co.

Continuity of Management— Key to 100 Yr Progress

In all probability, Dodson's century of virtually uninterrupted growth and stability could not have been achieved without continuity of business philosophy and management. Weston, Truman M. and Charles M. Dodson, the first generation of management, passed their credo on to a second generation of brothers, Truman M. II and Alan C., who were the active heads of the company from 1917 until their deaths in 1942 and 1946 respectively.

From 1946 to October 1, 1957, the third generation of brothers, C. Millard, John E. and Truman M., managed the helm. Millard, president from 1946 to 1954, resigned to become chief executive of Lehigh Coal & Navigation. John, president from 1954 to 1957, followed Millard to LCN as vice president in charge of its production. Picking up where John left off, Truman M. took over the Dodson presidency May 1 this year. When Weston Dodson merged with Lehigh Coal & Navigation, Truman was elected vice-president of LCN's newly formed bituminous coal sales subsidiary, Lehigh-Boone Bituminous Corp. which is headed by Vernon B. Bickmore.

The New President Speaks

Hard Coal Outlook: Prospects Excellent

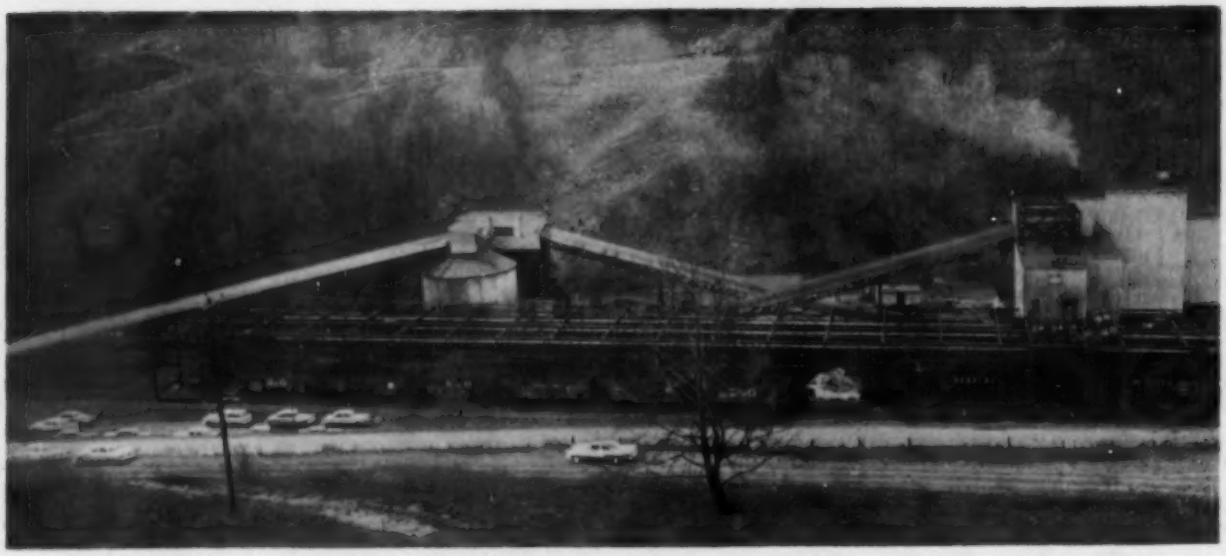
When Weston Dodson and Lehigh Navigation Coal Sales merged Oct. 1, Charles W. Dilley, formerly president, LNCS, was elected president of the Lehigh Navigation-Dodson Co. Foster F. Frable, who had been vice president (anthracite), Weston Dodson & Co., was named vice president of the new firm. Queried by *Coal Age* on anthracite's future, Mr. Dilley foresaw a gradual but definite swing back to hard coal.

"Anthracite has just come through a century which saw its fortunes reach heights of greatness and then, like an aging giant, give ground under the blows of comparatively young competitive fuels such as oil and gas. Yet, the qualities which made anthracite so acceptable during those peak years are still present. Anthracite is unchallenged as the finest fuel that nature has ever produced, and offers unrivalled heating efficiency and economy.

"These advantages ultimately should swing public favor back to anthracite, most especially in light of inescapable price increases of substitutes. Chances for regaining a substantial share of the home heating market are further enhanced by significant advances in anthracite burning equipment.

"Anthracite also has excellent prospects as an industrial fuel. The once lightly-regarded small sizes are now in maximum demand. The utilization of hard coal in the steel, cement, chemical, power generating and other industries is increasing steadily.

"The industry has been slow to accept as inevitable the fact that anthracite suppliers must provide the sizes and types of coal that the buying public wants. It is encouraging to note that hard coal is now gearing itself to satisfy modern-day consumer demands. We feel this has always been the policy of both Lehigh Navigation Coal Sales and Weston Dodson. It will continue to be the policy under their new entity, Lehigh Navigation-Dodson Co."



NEW PREPARATION PLANT processes 7,500 tpd of Pittsburgh seam. Facilities include sand-flotation cone, wet tables,

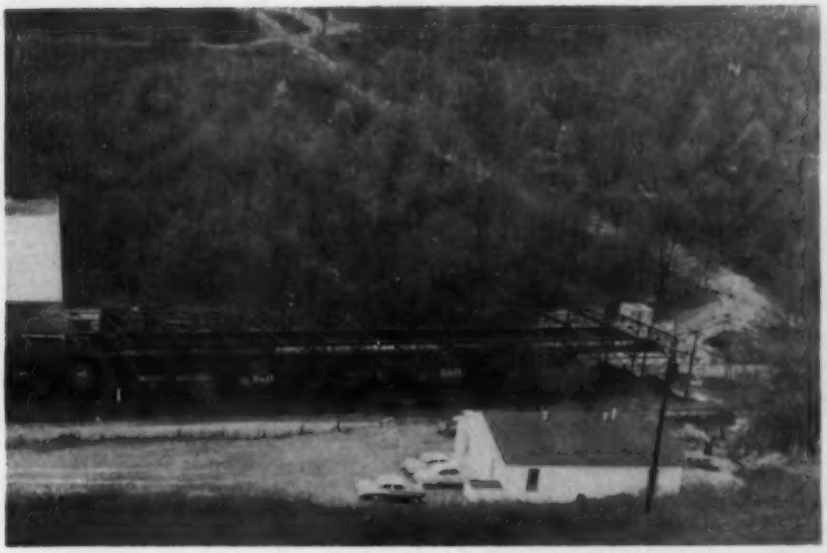
Complete Preparation . . . High Capacity Mining Highlight

HIGH-CAPACITY LOADER sets the pace for underground face equipment at the Compass No. 3 mine near Dola, W. Va.

SHUTTLE CARS, two per loading machine, carry big payload to belt conveyor system that carries coal to surface.

ANOTHER MILESTONE in the Clinchfield Coal Co.'s multimillion dollar expansion program has been passed now that the company's Compass No. 3 mine is operating at full capacity. Clinchfield's Compass division has boosted production by 7,500 tons per day with the new operation. With this new capacity the company is now able to mine, prepare and sell an additional 1,500,000 tons of Pittsburgh coal per year, bringing its capacity at Compass mines to 5,000,000 tons per year.

Coal is mined by high-capacity off-track equipment and is transported from the working areas to the new washing and drying plant over a network of belt conveyors. The Compass No. 3 cleaning plant not only has the facilities to wash, dry and screen all sizes but also has a triple shuttle-belt loading system that permits 60 railroad cars to be loaded



mechanical and thermal driers, thickener, filters and shuttle-belt car loading.

Concentrated mining in all-belt operation produces 7,500 tpd. Complete washing and drying facilities plus shuttle-belt car loading are features of new preparation plan.

By **A. E. Flowers** *Associate Editor, Coal Age*

Compass No. 3 Mine

UNIVERSAL cutter top cuts and shears right rib to a depth of 9 ft in all headings but beltway which is sheared on both ribs.

without moving them once they have been placed by the switching engine. This unusual car-loading system saved the cost of a large fill, bridge and railroad extension which would have been required for a conventional track installation. Another outstanding feature of the preparation plant is the application of a new-type centrifugal drier that produces a minimum of fines in the drying process.

Since 1949 the Compass properties have continually expanded. From the original strip mine producing 293,208 tons in 1949 operations were expanded with a highwall auger in 1951 and in January, 1952 the first deep mine, Compass No. 1 was opened. Other steps in the expansion program included the following: expanding Compass No. 1 deep mine in June, 1952; adding Compass No. 2 mine and cleaning plant in April, 1955; and now full-scale operation of the new Compass No. 3 plant in July, 1957.

The mine was bought from the Haywood Coal Co. on September 1, 1955 and renamed Compass No. 3. Immediately thereafter, Clinchfield initiated plans to expand the mine to 6,000 tpd and build a preparation plant including equipment for washing, drying and screening all sizes. Design and construction of the plant was contracted to the Industrial Engineering & Construction Co., Fairmont, W. Va. All electrical controls were supplied by General Electric and plant wiring was contracted to the West Virginia Engineering Co.

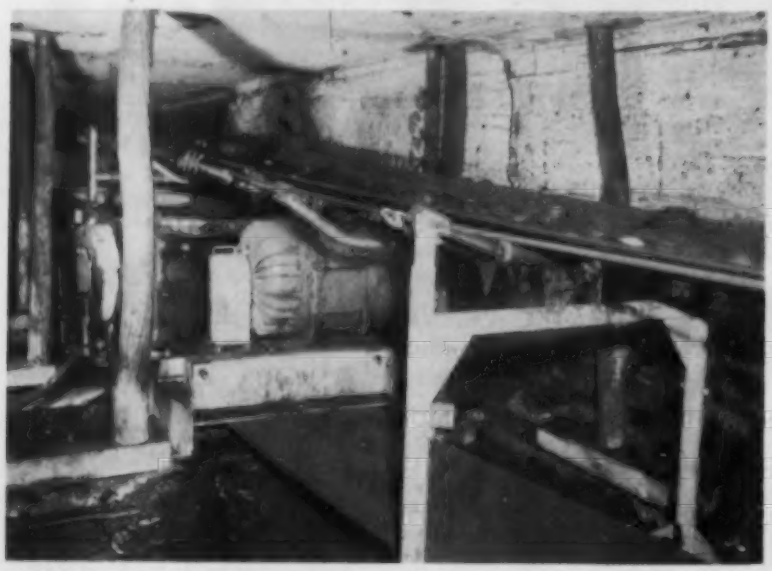
Five months after the property was bought, ground was broken for the new plant. The first coal was processed on November 30, 1956 and since then production has been increased to 7,500 tpd.

Mining Conditions

The Compass No. 3 mine taps the Pittsburgh seam at a point along Ten Mile Creek, near Dola, W. Va. At the portal the coal lies only 18 ft below the surface but it is well over 450 ft deep at the northern portion of the property. The coal has a uniform thickness of 7½ ft, of which the lower 6½ ft is mined. The top 1 ft is left to help support the roof.

A very friable drawslate of varying thickness forms the immediate roof. This material is full of slips and cracks and also weathers rapidly when exposed to air. Under the coal is a fireclay which breaks up under the

ALL-BELT MINE produces 7,500 tpd from two double sections in 14-heading entries. Conveyors are 30- and 36-in units. Lengths range from 1,380 to 2,400 ft.



ROPE BELT, 36 in wide, is one of the underground conveyors installed in series in the main entry. Belts carry coal from sections to cleaning plant.

constant pounding of shuttle cars or when in contact with water.

The coal is hard to cut and drill and is considered too hard for continuous mining. In an average shift a cutting crew will replace 75 machine bits. There are no clay veins in the coal but some sulphur balls are encountered. The seam usually dips uniformly 4% to the northwest but some fairly steep local grades are encountered.

Mining Results

Mining equipment is concentrated in two entries, the Mains and First Left. Each of these has 14 headings which are being developed with two off-track conventional units. Headings are driven 14 ft wide on 65-ft centers and breakthroughs are cut every 70 ft. Coal from both sections in each entry is carried to a belt conveyor in the No. 7 heading for delivery to the surface over a group of 30- and 36-in belts.

As part of a long-range drainage plan, the company plans to first extract the coal in the First Left area. Since this territory has the lowest elevation in the property, the company expects to use it as a sump for the whole mine. A borehole already has been drilled to tap the low point of the area. After pillars are extracted a deepwell pump will be installed to remove water which will drain by gravity to the abandoned area.

Each of the four mining sections is equipped with a Joy 11-BU loader, 10-RU cutter with a 9-ft bar, two 10-SC shuttle cars, Jeffrey 56RD roof bolter and Schroeder hydraulic coal drill. This equipment is operated and serviced by a 13-man crew whose duties are as follows: 1 loader operator, 1 loader helper, 2 cutter operators who also drill coal, 2 roof bolters, 2 shuttle car operators, 1 shotfirer, 1 mechanic, 1 ventilation man, 1 cleanup man and 1 foreman. Average output per crew is 600 tons per shift.

Coal is top cut and sheared on the right rib, except in the belt headings which are top cut and sheared on both ribs. Four shotholes are drilled in each cut. Three are placed 18 in from the bottom and the fourth is drilled 2 ft above the bottom row and 1 ft from the left rib. Holes are fired singly, starting at the right side of the cut next to the shear.

Each loader is served by two shuttle cars that carry coal to a belt conveyor in the No. 7 heading. Belts are extended every 150 ft to keep coal hauls to a minimum. The First Left entry has a group of Joy 30-in units in series and the Mains has two conventional 36-in Hewitt-Robins

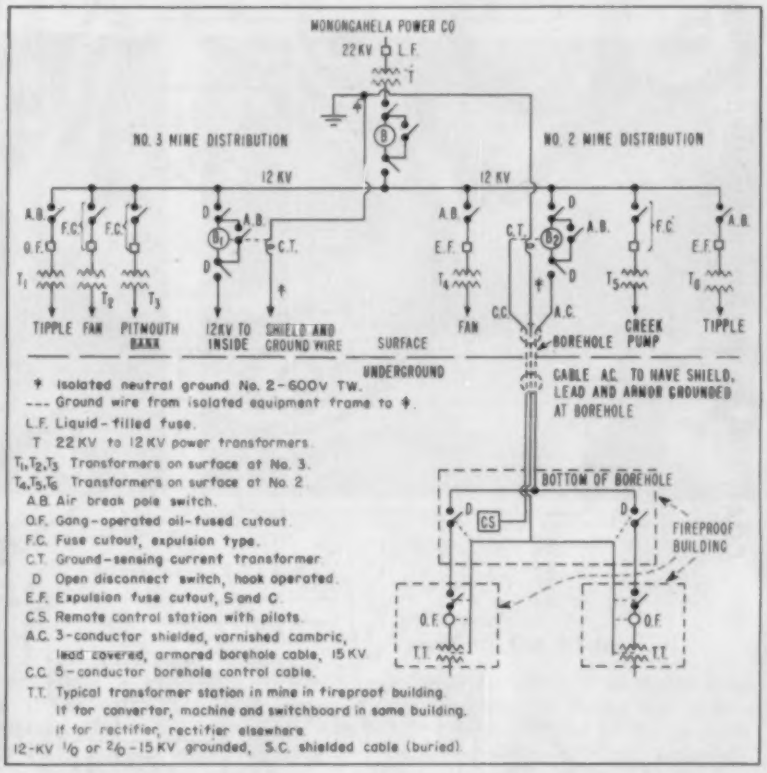
DRAG, connected to shuttle car bumper with wire rope, keeps travelways smooth for shuttle cars.

ROOF CONTROL is provided by 5 ft by ⅝-in expansion-type bolts installed on 4-ft centers with hydraulic rotary unit.

▲

Floor and roof receive close attention at Compass No. 3.

COMMUNICATION units and safety items are mounted on jacks.



SCHEMATIC DIAGRAM shows how 12,000-v power is distributed at Compass Nos. 2 and 3 mines. Protection is provided for both men and equipment.

units and one Goodman 36-in rope belt. Details of the belt system are shown in an accompanying diagram.

As soon as a cut of coal is loaded out, expansion-type roof bolts are installed. Three 5-ft by ⅝-in high-tensile Youngstown Sheet & Tube bolts are installed 4 ft apart in each row and rows also are 4 ft apart. This pattern leaves a 3-ft space between the rib and the nearest bolt.

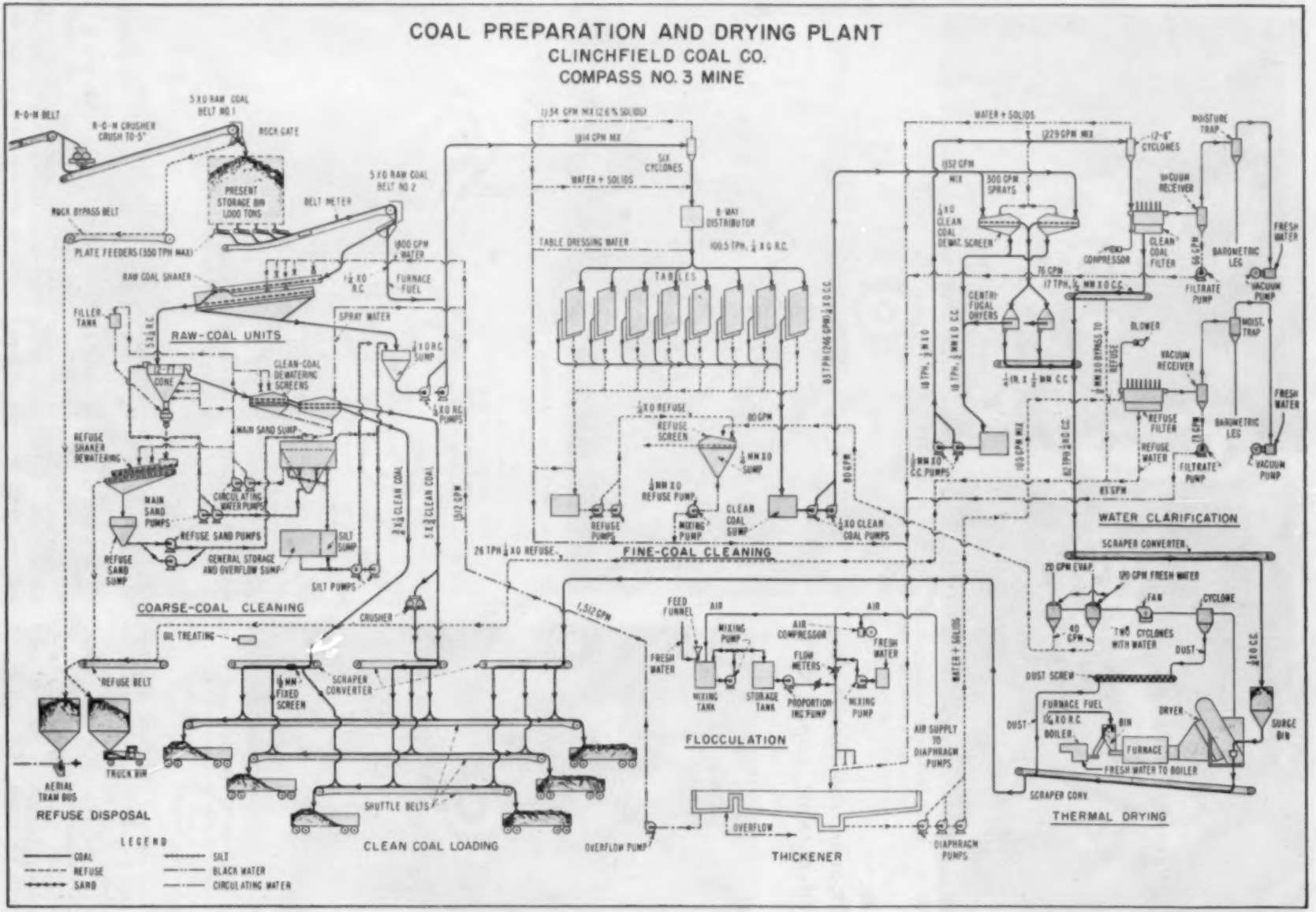
The two bolting men set an average of 100 bolts per shift or as many as are necessary to keep pace with the mining cycle. Bolting machines are equipped with Schroeder hydraulic coal drills so that the men can help drill coal if the cutting machine is slowed by adverse conditions.

Additional roof support is provided by center posts at all intersections and in some cases by a four-piece set where the roof is particularly weak or where a heading must be

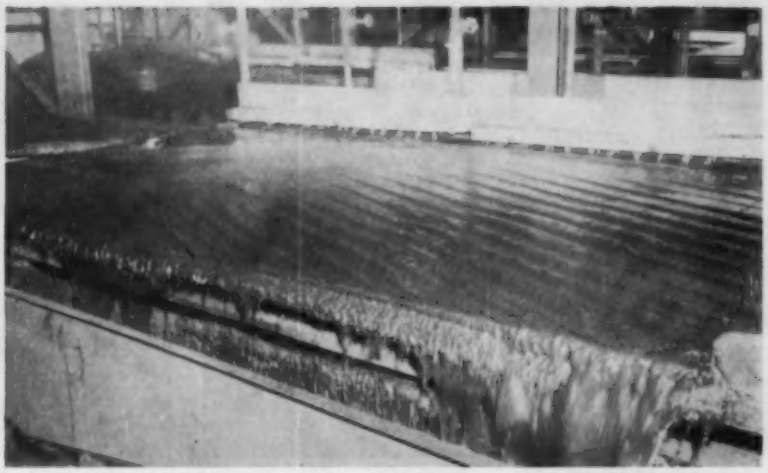
COAL PREPARATION AND DRYING PLANT

CLINCHFIELD COAL CO.

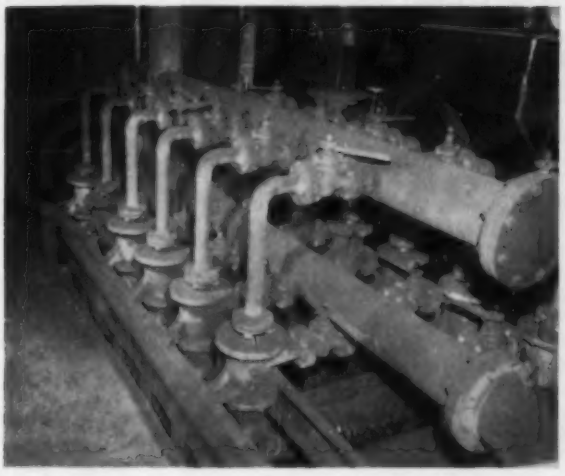
COMPASS NO. 3 MINE



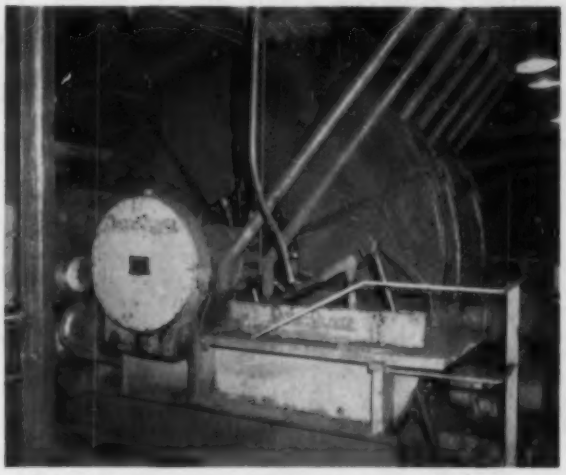
COARSE-COAL CLEANING is done in cone. Raw coal contains 15% refuse.



FINE-COAL WASHING is assigned to a group of eight wet tables receiving 100 tph of raw coal. Tables are fed by an eight-way revolving distributor.



CYCLONES, twelve 6-in units, concentrate coal from 1,229 gpm of water and coal mixture before it passes to filter.



DISK FILTER recovers ⅛mmx0 coal removed by dewatering vibrators ahead of centrifugal driers.

maintained for a long time. With this additional roof support the company expects to be able to keep three headings open as intakes and three open as returns.

Mine supplies are delivered to the working sections over a 42-in gage supply track laid with 40-lb rail on a combination of steel and creosoted wood ties. Supplies are loaded into mine cars by the supply crew which delivers them as near to the face as possible. The supply tracks are laid parallel to the belt headings and are extended as the belt conveyors are lengthened.

Ventilating the Mine

To provide a constant flow of fresh air in event of a motor failure, the Compass No. 3 mine has a dual fan installation. A Joy 8-ft fan driven by a 150-hp 440-v AC motor provides 200,000 cfm of air at a water gage of 4½ in for two splits. The auxiliary fan is a Joy 6-ft unit and is driven by a 100-hp motor. Both fans have a common housing leading to the mine. A butterfly valve in the opening leading to the main fan can be closed and a door covering the outlet to the secondary fan can be removed in a few seconds. Thus the auxiliary fan can be put in operation quickly and the flow of fresh air restored.

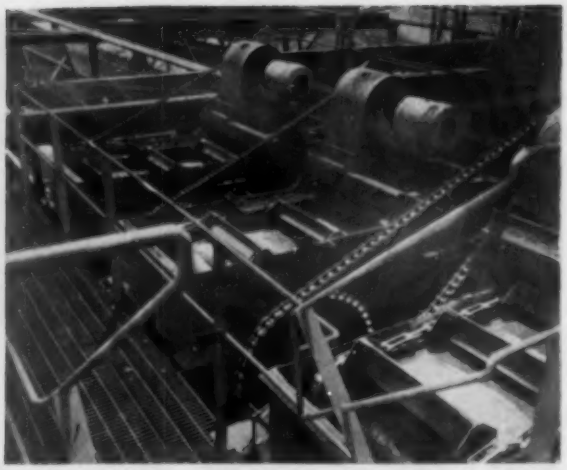
To ensure ample cross-section area and the lowest possible friction, extra roof support is provided in six headings to prevent falls.

Powering the Mine

Electrical energy is purchased from the Monongahela Power Co. at 12,460 v and delivered to the property through a General Electric automatic reclosing circuit breaker. At the No. 3 mine portal there is a General Electric automatic circuit breaker with ground trip and a bypass to a bank of 500-kva outside transformers.

Power is taken underground by Anaconda 15,000-v single conductor 2/0 shielded cable. Cable components include 1⅜4-in Anaconda butyl insulation, 37-strand semi-conducting tape, electrostatic copper tape shield and ⅜4-in neoprene jacket. A separate No. 2 ground wire is carried with the three conductors.

CENTRIFUGAL DRIER handles 65 tph of ¼ in x ½-mm coal plus 50 gpm water. Unit cuts total moisture to 6½%.



SCRAPER CONVEYORS straddling shuttle belts can discharge coal onto any one of car-loading shuttle belts.

Screen Analysis, Feed and Products, Humboldt Drier

Size	Vibr Feed % Wgt	Humboldt Feed % Wgt	Humboldt Product % Wgt	Humboldt Effluent % Wgt	Cl. Coal Filter Cake % Wgt	Drier Feed % Wgt
plus ¼	0.11	—	—	—	—	—
¼ x 4M	1.65	2.23	1.74	—	—	1.55
4 x 6M	14.33	18.18	15.79	—	—	13.78
6 x 8M	11.77	18.31	17.16	—	—	13.98
8 x 12M	10.81	18.08	17.04	—	0.25	13.24
12 x 16M	11.50	13.38	15 22	0.05	0.53	12.96
16 x 20M	9.54	11.62	11.13	0.09	2.42	10.66
20 x 30M	9.15	7.53	8.32	0.78	15.63	9.55
30 x 40M	6.56	4.39	4.65	2.63	18.70	6.30
40 x 50M	5.64	2.62	3.07	4.91	18.58	4.36
50 x 60M	1.97	0.68	0.91	3.10	7.34	1.63
60 x 80M	3.11	1.01	1.40	7.25	11.28	3.54
80 x 100M	0.78	0.35	0.61	4.44	5.00	1.11
100 x 200M	3.92	0.63	1.18	14.72	10.50	3.39
200 x 325M	0.42	0.10	0.15	2.81	1.44	0.22
minus 325M	6.68	0.89	1.63	59.22	8.33	3.73
	100.00	100.00	100.00	100.00	100.00	100.00
One unit, % solids	26.83	78.58	92.99	3.02	75.76	86.90
Two units, % solids	32.16	75.00	92.97	2.86	78.59	87.9

The main feeder for the whole mine is carried up the mains in a ditch. Cable is added in 1,000-ft lengths. All splices are brought out of the ground and placed in a fenced, dry area where they are visible and handy to get to if they need servicing. Any secondary line from the main feeder is 1/0 and has the same specifications as the 2/0 cable.

At each 125-hp belt head there is a bank of three standard single-phase 75-kva transformers connected delta-delta. Panel belts with 60-hp motors are served by three 37½-kva single phase transformers connected delta-delta. All belts operate at 440-v AC. All oil substations are housed in fireproof buildings designed to meet USBM and West Virginia specifications.

Each face section receives DC power from a 200-kw rotary converter. Direct current is carried from the substation to face areas by 1-million cir mil feeders. Additional DC power is provided by a 150-kw m-g set that primarily serves the trolley wire. To provide good face voltage underground substations are moved ahead every 3,000 ft.

At all underground substations and transformers G & W underground oil-fused gang-operated cutouts are used to permit independent operation of each section. To provide additional safety for workers a regular fused cutout is placed on the high-voltage side. This provides a break in the circuit that can be seen.

Plant Construction

Ground was broken for the Compass No. 3 plant in February, 1956 and it went into operation on November 30, 1956. Since that time mine output has gradually been increased to its present 7,500-tpd capacity. Design and construction of the plant was by Industrial Engineering & Construction Co., Inc., Fairmont, W. Va.

Coarse-Coal Circuit

Coal from the 36-in slope belt discharges onto the No. 1 R-O-M Robins belt which discharges either directly onto a second Robins unit or flows to a Jeffrey crusher that breaks it down to 5 in top size. The discharge end of the No. 2 belt is fitted with a twin chute that permits mine rock to be diverted to the rock bins. Raw coal is delivered to a 1,000-ton storage silo.

Four plate feeders under the 1,000-ton bin operate in pairs to discharge coal onto a belt that elevates and conveys the coal to a Murry-drive raw-coal shaker where it is wet screened into 5x¼ and ¼x0 fractions. The 5x¼ passes to a 12-ft Chance cone where coal and refuse are separated at 1.45 specific gravity.

Clean 5x¼ coal passes to a pair of 6x16-ft Allis Chalmers doubledeck dewatering vibrators set in tandem. These units also split the coal into 5x¾ and ¾x¼ sizes. The 5x¾ may be reduced down to ¾ in top size in a Gundlach double-roll crusher or may be passed directly to a 34-in flight conveyor which runs out of the

ELEVATED SHUTTLE BELTS over loading tracks permit 60 cars to be loaded without moving them once they are placed.

OPERATOR'S CAB at each end of belt permits clear view of loading belt. One man operates each belt.

plant and over three shuttle belts that load railroad cars. Coal may be discharged onto any one of the shuttle units.

The ¾x¼ passes to a second 34-in flight conveyor which also spans the three loading tracks. As it drops onto the flight conveyor, this size may be oil treated.

Cone refuse is dewatered on a shaker screen which delivers it to a 30-in refuse belt. This unit in turn carries it to either an aerial-tram refuse bin or a truck bin. The aerial tram carries rock 2,500 ft to the top of the hill and discharges it in the next valley. Underflow from the refuse dewatering screen passes to a 9-ft refuse sand sump from which it is recirculated to the main sand sump.

Fine-Coal Cleaning and Drying

Raw ¼x0 flows to a sump from which it is pumped to six 12-in Dorr-clones. Underflow from these units passes to an 8-way Concenco distributor feeding eight Deister Concentrator wet-washing tables. Effluent is delivered to a 75-ft Dorr refuse thickener.

Clean ¼x0 flows to a sump and is pumped to two Allis Chalmers Low Head vibrators equipped with ½-mm Wedge Wire screens. The dewatered product is split and sent to a pair of Humboldt centrifugal driers. Feed to the vibrators contains approximately 25% solids and the dewatered product comes off with 75% solids. Handling 65 tph of feed per drier, the centrifugal machines reduce the total moisture to 6½%.

One of the centrifugal units usually can handle all of the ¼x0, leaving the other one in reserve as a spare. It has not been necessary to change screens on the units from the time they went into operation on Nov. 30, 1956 up to May, 1957.

Another feature of the centrifugal driers is that a minimum of degradation takes place as the coal is dewatered. For example, the feed to the drier contains 57.8% of ¼x12M material and the dewatered product contains 51.7% of this size material, a decrease of only 6.1%.

The effluent from the Humboldt driers contains 2½% solids with a top size of 50-mesh and 70% of the solids is minus 200-mesh. Water and fine solids flow to a ½-mm clean-coal sump from which it is pumped to a battery of twelve 6-in cyclones. Cyclone underflow is delivered to a Dorr-Oliver clean-coal disk filter.

The filter cake joins the mechanically dried coal from the Humboldts and the combined products are delivered to a surge bin. From there the coal is delivered to a Link Belt Multi-Louvre thermal drier. After leaving the drier, the coal is delivered to a third scraper conveyor spanning the three Jeffrey shuttle belts over the railroad tracks.

Each loading track holds 20 cars and the shuttle belts are one-half the length of the loading tracks. One-half of the cars are loaded with the belts running in one direction and the other half with them running the opposite way.

Each belt is controlled independently from an operator's cab at either end of the conveyor. Conveyors are mounted on wheels that travel on 60-lb rail welded to the top of steel beams running lengthwise over the railroad cars. Each operator has independent control over his belt, but all are interlocked with the electrical system of the preparation plant.

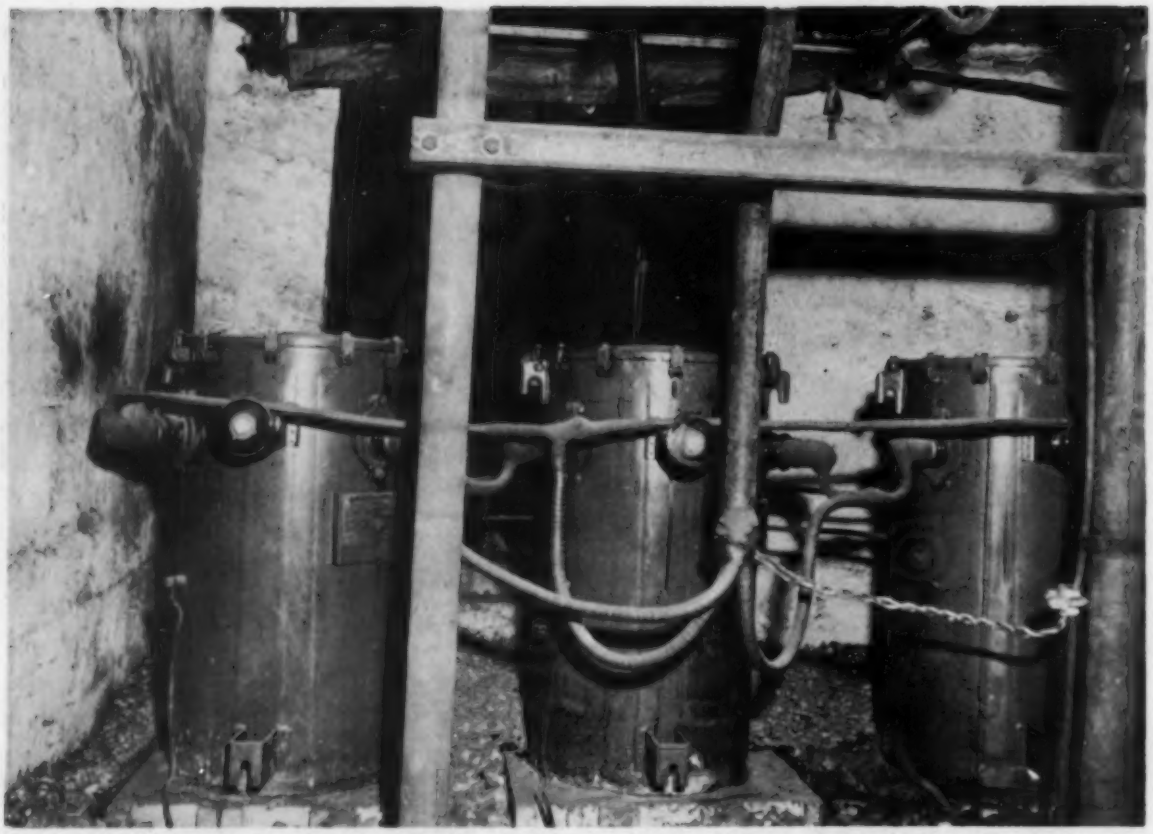
Water Clarification

To speed settling of the solids in the Dorr refuse thickener, Separan flocculant is added in controlled quantities. The Separan is fed into a tank of water and mixed by a stream of air flowing through the mixture. A circulating-tank pump takes solution from the bottom of the tank and puts it back in the top or transfers it to a storage tank from which it is delivered to three sets of sprays over the flume carrying material to the thickener. Starting with a 1½% solution in the mixing tank, the Separan is diluted to .05 of 1% by the time it gets to the thickeners.

Underflow from the refuse thickener is pumped to a Dorr-Oliver refuse disk filter. The filter cake is conveyed to the refuse bin and the filtrate is pumped back to the thickener. Underflow from the clean-coal filter also is sent to the thickener.

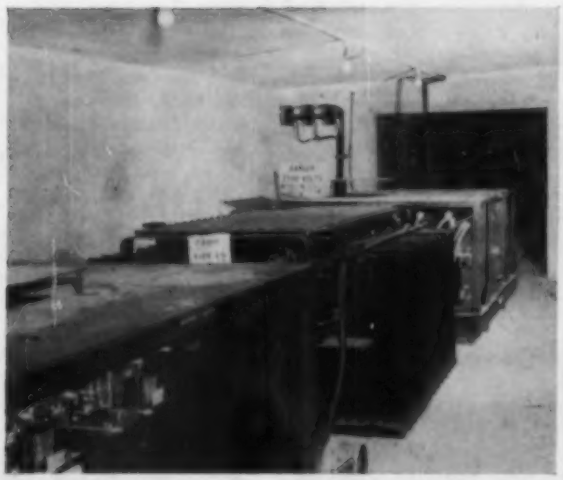
In July Clinchfield signed a contract with Industrial Engineering & Construction Co., Inc. for two additions to the plant. The first work will include installing crushed-coal rescreening facilities to handle 200 tph. Screens will be provided to remove oversize from the crushed clean coal and separate the 1¼x0 into 1¼x¾, ¾x¼ and ¼x0 sizes. This work is scheduled to be completed during the last quarter of 1957.

The second part of the contract calls for installation of two Baughman cascade-type thermal driers. These machines will dry the ¾x¼ at the rate of 120 tph and are scheduled to be operating in January of 1958.

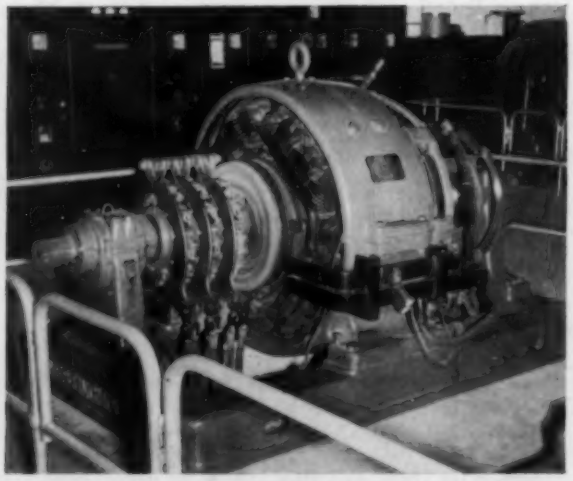


TRANSFORMER INSPECTION should include checking wiring, connections and proper grounding. They should be installed in fireproof cells. Liquid-filled transformers should be checked once a year for moisture and sludge content.

Inspection Guide for Deep Mine Equipment



CLEANLINESS is important to the performance and maintenance of rectifiers. Include cleanliness in each inspection.



SOLID FOUNDATION and adequate protection to equipment and personnel are essential to rotating equipment.

Preventing machine breakdowns and reducing maintenance cost are the primary goals of all maintenance organizations. Good preventive maintenance, a system for inspecting equipment and a complete record of inspections will help reach these goals.

This three part guide is a complete roundup of what to look for and how to go about inspecting deep mine equipment. Part one, in this issue, deals with substations, feeder systems and section loading points.

By Daniel Jackson, Jr.
Assistant Editor, Coal Age

Substations

A COMPLETE RECORD should be kept on each substation. This record will serve two purposes. First, it is additional assurance that inspections are made at specified times. Second, it provides a detailed history of each station. The record must contain all nameplate data required for installing, operating and testing the substation. Daily entries should consist of date and time of inspection and any repairs or changes made. Experience has proven that daily preventive maintenance reduces power interruptions. It is especially important to note the time, duration and cause of any power interruption. This information will often give clues to present and future breakdowns. Entries should be made by qualified personnel. Keep the record in a clean dry place.

A careful inspection of a substation is not completed in a matter of a few minutes. First, acquaint yourself with the condition and past performance of the machine by checking the record book. When starting the inspection take out your notebook and pencil and get ready to make the necessary notes. Don't trust your memory. Your notes will aid in the final report of your inspection. A more complete, detailed report can be made by keeping good notes.

Inspection of a rectifier should include the following:

1. **Transformers.**
2. **AC control panel.**
3. **DC control panel.**
4. **Excitation circuit.**
5. **Mercury tubes.**
6. **Cooling system.**

Dry transformers require less attention than most other electrical apparatus. They do, however, require some maintenance. The temperature, load and insulation condition should be checked periodically and recorded. Dust settling on core, windings and jackets reduce heat dissipation. Make sure that no dust is present. Liquid filled transformers require more maintenance than dry transformers. The liquid in transformers should be checked once a year for moisture and sludge content, both of which should be removed. Gaskets, insulators, connections and wiring also should be examined, noting faulty conditions.

There are two necessary steps in inspecting a rectifier:

1. Observe the station in operation. Meters, relays, and breakers should be checked for proper setting and operation. Compare ammeter and voltmeter readings at various loads to make sure that the voltage is right for each load condition. Read the excitation ammeter which will indicate proper or improper function of the voltage regulator. Compare AC and DC breaker outages. Get a record of the current on each tube with a hook-up type meter. Compare readings making sure that each tube is taking its share of the load. Observe closely the misfire indicating lamps. Excessive flickering will indicate that the tube is misfiring. Temperature, pressure and water level of the cooling system should be checked.

2. Shut the station down for further inspection. This step must be performed between or after production shifts. Insnection will be primarily mechanical in nature. Detailed inspections of all relays and breakers should include contacts, wiring, connections and all moving parts. Cooling systems and heat-exchangers require examination of piping, radiator, water pump, pump motor and blower motor. Make sure that necessary repairs are made promptly.

Close inspection of commutator, slip rings, brushes, brush-holders and bearings is required with synchronous converters or motor-generators. Since mechanical unbalance or machine misalignment produce undesirable vibration, these should be checked for and corrected. Each bearing on the machine should have a thermal relay. Oil rings should rotate and the proper level of oil should be kept in the bearings at all times. An excess of oil on the outside of the machine indicates the use of improper weight and grade of oil. Take the necessary corrective steps. The machine should be equipped with an overspeed relay. Check its operation. Commutators and slip rings acquire a shiny protective gloss, which tends to reduce wear. In most cases, a chocolate brown commutator is a good indication of good commutation. Other things to be included in checking the commutator are: high mica, grooving, out of round, burns, and flat spots. Make sure that such conditions are corrected promptly. Brush and brush-holder inspection should cover adjustment, clearance, staggering, angle, spacing, seating and pressure. Good commutation depends on each being correct.

Wiring diagrams and instructions aid in troubleshooting breakdowns. Breakdowns usually mean replacement of parts. Check parts list, keep them at the station and make sure that it is complete. Protective material at the substation such as, rubber matting, fire equipment, and first aid kits should be looked over carefully. Proper ventilation in a substation is a must. Check ventilating facilities on each inspection. Communication should be maintained to all substations. Telephone or radio should be in good operating condition. Important in the maintenance of a substation is making sure that it is clean at all times.

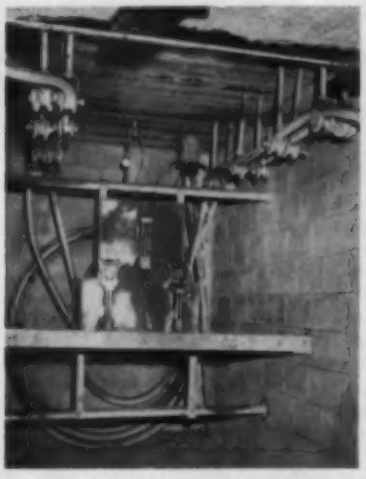
After the inspection, a report should be written and sent to responsible operating and maintenance heads. Repairs and recommended maintenance attention should be marked urgent, routine, or general depending on their importance. After sufficient time has been allowed for making repairs a check inspection should be made. The check will serve to speed up repairs and to assure that the necessary preventive maintenance measures are taken without delay. Failure to do so may result in machine downtime.

Feeder Systems

Inspection of mine-power feeder systems should include the following:

1. **Feeder size.**
2. **Splicing.**
3. **Shunts.**
4. **Switch location and protection.**
5. **Bonding.**
6. **Insulation and feeder suspension.**

PROPER SETTING of relays and meters should be checked frequently. Observing station under load aids in making necessary adjustments and corrections.



FEEDERS should contain adequate facilities for sectionalizing the system.

INSPECT trolley and feeder insulators for leakage due to breakage or dampness.

Two different factors are involved in checking on feeder size.

1. Feeder lines must be capable of carrying rated load. Load is governed by mining methods, equipment and conditions. Portable meters, recording-type instruments and "sum-of-horsepowers" may be employed to arrive at the average load that feeder lines will be required to carry. Determine present size of feeder. This requires more than simple gaging. The feeder also must be inspected for damage which would decrease its carrying capacity. Make necessary repairs and bring feeder back to standard. Load then should be compared to feeder capacity to determine if capacity is sufficient. At 30C ambient temperature, 45-deg rise, for example, approximate ratings are: 500,000 cir. mils, 800 amp; 1,000,000 cir. mils, 1,230 amp; 1,500,000 cir. mils, 1,550 amp (*Coal Age*, Mining Guidebook, Mid-July, 1957, p. 99). If capacity is insufficient for rated load, calculate the additional feeder that would be required. Incidentally in increasing feeder capacity, it is better to use a number of smaller cables than one large one because the current-carrying capacity is greater.

2. Distance that DC can be transmitted has its limits. The maximum should not exceed, 3,000 to 3,250 ft. Even with the maximum in feeder capacity it is difficult to maintain adequate voltage for 250 V motors at much over 4,000 ft. Often, the addition of more copper will not noticeably increase the voltage. Since the addition of copper is not always a cure, it may be necessary to relocate the substation or add another.

Inspect all splices electrically and mechanically—electrically for heat and ability to conduct electricity and mechanically for strength. Electrical cables should be spliced with proper material. Often, wire rope clamps are used to make feeder splices. If so, make sure that more than one clamp is used at each splice.

Because haulage locomotives impose heavy demands it usually is necessary to connect trolley lines to the feeders by shunts or stingers. Shunts should be installed at 200-300-ft intervals. Good connections, shunt size and spacing are important points. Make corrections where necessary.

Switches or protective devices should be located at each circuit leaving a substation, mining setup or branch circuit. Feeder and trolley switches or protective devices should be spotted at intervals of not over 1,500 ft. Check on overcurrent circuit-breaker settings or fuse ratings and keep them as low as practical for good operation.

Bonding and the supplemental return are the most neglected parts of the mine-power distribution system. Therefore, it is especially important that they be given special attention. For a complete detailed inspection it will be necessary to check the following:

1. The condition of each bond.

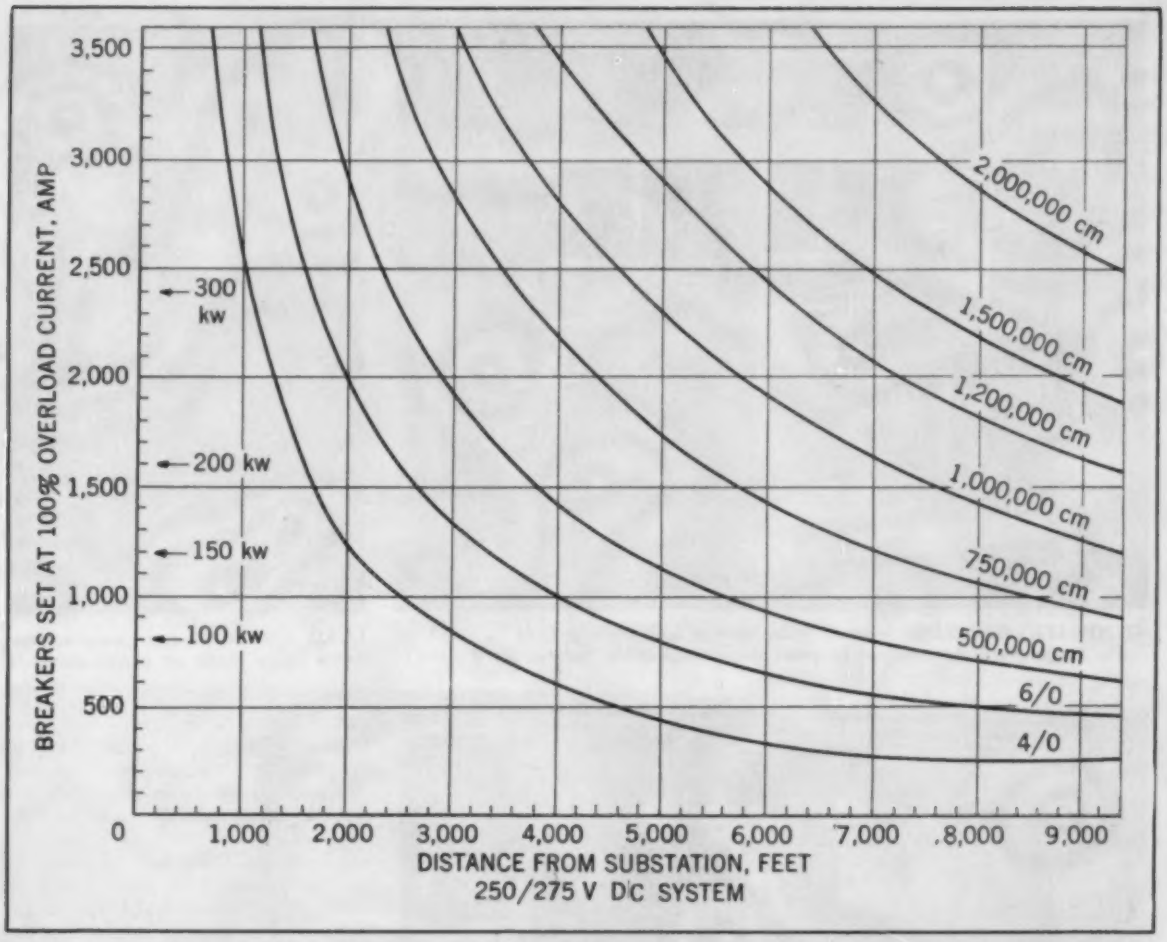
2. The bonding around each track switch.

3. Cross bonding.

4. The supplemental return for connections and damage.

5. Supplemental return tie-ins to track.

Checking bonds will require the use of a small bar and hammer. Each bond must be inspected to make sure that it is not loose. Mistakes in placing bonds are often made at track switches. Check for continuity of bonding through switches. Cross bonds should be spaced at approximately 100 ft. Supplemental return tie-ins also should be made approximately every 300 ft. Check for proper spacing and connections. The supplemental return should be examined for damage. Better protection and maintenance is obtained by placing the return 6 to 8 in above



LIMIT OF CURRENT FLOW in a circuit at various distances from substations for various sizes of conductors is shown in the above chart. Compare feeder sizes and current demands of your system to determine proper carrying capacity.

Unit Resistances of Common Sizes of Copper Wire and Steel Rail

COPPER WIRE

Size, CM	Resistance Ohms per 1,000 Ft
1,500,000	0.00719
1,200,000	0.00899
1,000,000	0.0108
750,000	0.0144
500,000	0.0216
300,000	0.0360
211,000	0.0509

STEEL RAIL

Weight	Equivalent Each Rail CM of Copper	Resistance, Ohms per 1,000 Ft (Both Rails Bonded and Cross-Bonded)
30	300,000	0.0180
40	400,000	0.0135
50	500,000	0.0108
60	600,000	0.0090
70	700,000	0.0077
80	800,000	0.0067
90	900,000	0.0060
100	1,000,000	0.0054

bottom. This can be accomplished by driving spikes in posts along track and laying the return on the spikes. The return is visible and in better position for more frequent and more thorough inspections. Corrections and repairs to return or bonded track should be made promptly to avoid power losses.

Insulated feeder is necessary only for certain applications. Cables in bore holes, shafts and on sections should be insulated. Feeder lines from holes or inside substations need not be insulated, except on sections, as noted. However, cables must be guarded and insulated at all loading and unloading points and track switches. Important in feeder installation is to make sure that feeder lines are suspended on properly spaced insulators.

The rule in feeder maintenance should be proper capacity for the load and transmission distance, frequent inspection and prompt corrective measures.

Section Loading Points

Section loading points regardless of type should be inspected in detail. Loading points are the connecting links between the working face, and the main haulage and the outside. The transfer of coal, communications and spare parts and equipment are concentrated at this point. It is necessary to spend enough time to observe the equipment. Check its ability to do required work. Study the mining conditions. If conditions are extreme it may be necessary to step up the preventive maintenance program at this point. Check to make sure that equipment is not being misused. Equipment should be inspected for electrical, mechanical and lubrication maintenance repairs.

Breaker and bus bar facilities should be checked. Inspect the breaker for proper setting, feeder connection, location and insulation. The breaker setting should be as low as practical for good operation. In-

AUTOMATIC BREAKERS separate main haulage and working faces to distribute loads. Proper load settings and frequent inspections assure uninterrupted service.

LOAD TESTS using a clamp-on ammeter keeps check on power demands.

SECTION LOADING POINTS using belt and mine car haulage should be well maintained. Make sure that structures are rigid and that area is kept clean.

coming and outgoing feeder connections to breaker and bus bar should be checked for tightness. Breaker and bus bar should be located in a safe place, particularly away from moving equipment. Make sure that the roof is good. Insulating mats are required at breaker and bus bar. Check, making sure that the bus bar is guarded at the nip location.

Loading points contain varied types of equipment to transfer coal from one type of transportation to another. Complete and systematic inspections of mechanical equipment of this type are best accomplished by dividing the inspection into three parts.

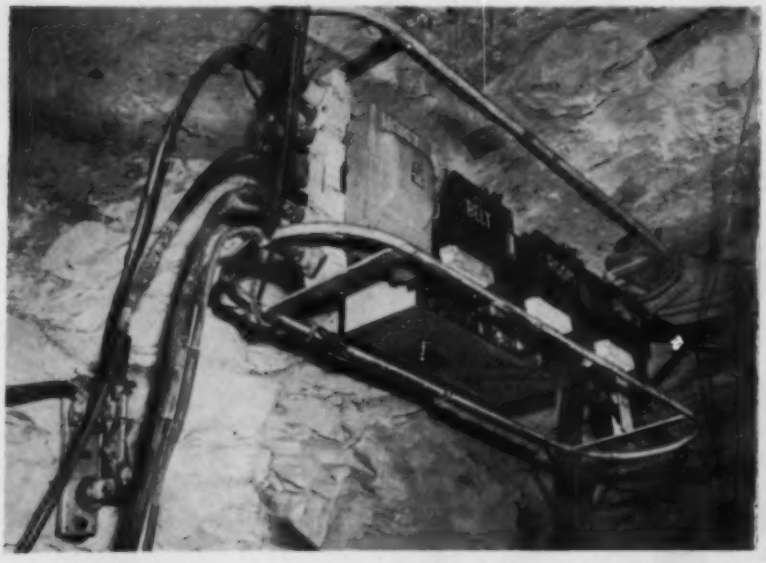
1. **Mechanical:**
   - Frame and side boards.
   - Wheels and axle.
   - Speed reducer.
   - Drive chain and sprocket.
   - Conveyor chain.
   - Wearing strips.
   - Drive shaft.
   - Takeup shaft.
   - Elevating assembly.

In detail, look for broken, bent and loose parts in frame and sideboards. Check wheels for slack in bearings, loose or missing lugs and proper air pressure in tires. Test for slack in speed reducer bearings. Note any unusual sounds. Check connecting links and roller links of conveyor and drive chains for wear, breakage and missing cotter keys. Proper alignment and tension of chains are important. Further inspection of the conveyor chain should include looking for broken, bent and missing flights. Flights should be equally spaced. Check conveyor-chain wearing strips for wear and looseness. Test drive and takeup shafts for slack in bearings and alignment. Elevating assembly should be inspected for proper working adjustment.

2. **Electrical:**
   - Motor.
   - Control panel.
   - Wiring.
   - Fuses.
   - Overloads.

Record load of motor by using a clamp-on-type ammeter. If load is in excess of rating, check angle at which equipment is sitting. Overload can be produced by placing equipment on too steep a grade for normal loading. Also, coal should not be allowed to accumulate around motor. Reduced heat dissipation will cause motor to over-heat. Remove motor covers and check brush length, shunts and spring pressure. Make sure that brushes are free in brush-holders. Inspect commutator for high mica, grooving, flat spots, also mica V-ring

SHUTTLE CAR AND ELEVATOR loading points should be kept clean. Controls, supplies and communications are important check points. Check them daily.



LOAD CENTERS at section loading points should be equipped with a master switch (left) and separate breakers for each equipment item.

for dirt and grease. Observe control panel for proper sequence of operation. Contacts, shunts and wiring should be inspected. Proper rating of fuses and correct operation of overload relay are important. Check.

3. **Lubrication:**
   - Motor bearings.
   - Speed reducer oil level.
   - Drive shaft bearings.
   - Takeup shaft bearings.
   - Drive chain.
   - Idler sprockets and bearings.
   - Elevating assembly.

Lubrication of equipment is of primary importance. Proper application, lubricating facilities and fittings are necessary. Make sure that the required grades of grease and oil are being applied at the right places. Check lubricating facilities such as grease and oil guns to make sure they are adequate and in good operating condition. They should be stored in a safe place while not in use. Look for missing and damaged grease fittings. Make sure they will take grease. Check lubrication chart of motor to see if bearings are being greased at scheduled periods. Remove speed reducer check plug to test for correct amount of oil. Visual inspection of all moving parts made to determine if equipment is receiving proper lubrication attention. Keep in mind that good operation and a minimum of breakdowns are accomplished by lubricating the equipment in accordance with manufacturers recommendation.

Operation and use of car-spotting hoist should be observed. In checking the hoist it will be necessary to check its position. Make sure that the rope picks up and distributes itself evenly on drum. Check hoist rope for condition, method of attaching to drum and attachment of safety hook. Test for slack in drum shaft bearings. Check guards and covers for missing bolts and bent and torn places rubbing against moving parts. All gears and pinions should be inspected for wear and alignment, and the brake mechanism for worn lining and adjustment of shoes. The apparatus used to hold hoist in place should be given the once over. Examine to make sure that the hoist will not pull out. The electrical control of most hoists is simple, it usually consists of a contactor operated by a push-button or a plain single-pole switch without a contactor. Condition of contactor, wiring and control switch should be checked. Motor inspection should consist of checking the commutator for high mica, grooving, flat spots, and the mica V-ring for dirt and grease. Inspect brush length, shunts and spring pressure. See that brushes are free in brush-holders.

Properly applied oil and grease at required points will assure good service from the hoist. Lubrication of all moving parts, gears and bearings should be checked. Check motor bearing record book to see if bearings are being greased at scheduled periods.

All loading points also should be checked for the following:

First aid equipment.

Fire control equipment.

Proper communication facilities.

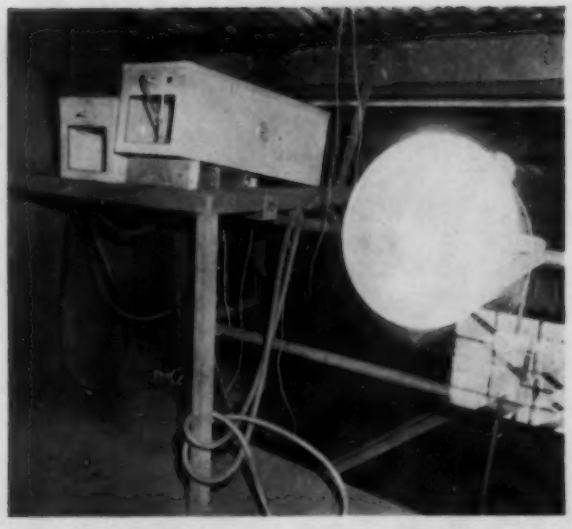
Necessary supply of spare parts for equipment.

Accumulation of coal around loading points.

Impress upon the section foreman that a daily check of the above be made.

Thorough periodic inspections of section loading points should keep the number of production delays to a minimum. In the report stress the need of prompt preventive maintenance.

TWO MONITORS at hoist operator's station give him an 8x10-in picture of dumping area. Duplicate systems assure a continuous picture if one unit needs maintenance.

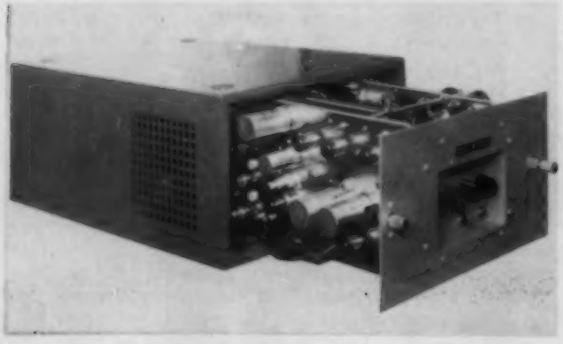


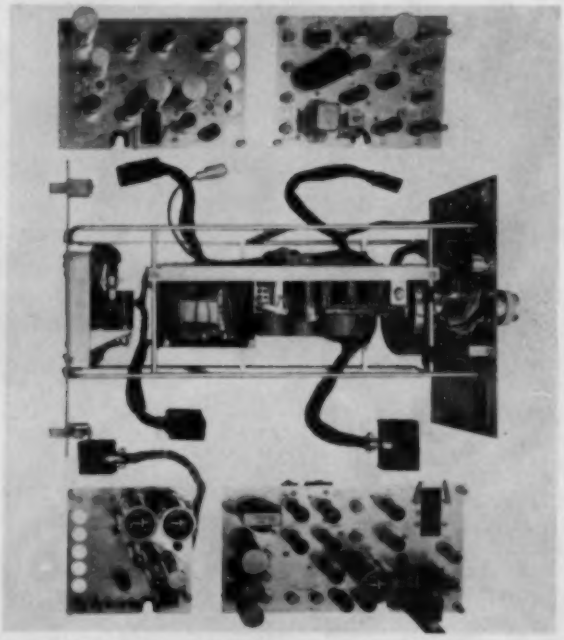
TWO CAMERAS focus on the dumping area and bin. One serves as spare. Powerful 750-w floodlights and 150-w sealed-beam lights illuminate area at night.

Safer, lower-cost skip hoisting results from Peabody's use of

Closed-Circuit Television

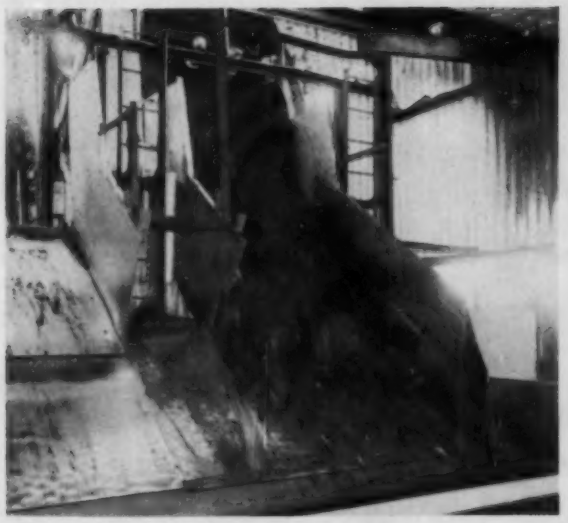
SMOOTHER AND SAFER hoisting is the result of successful application of closed-circuit television.



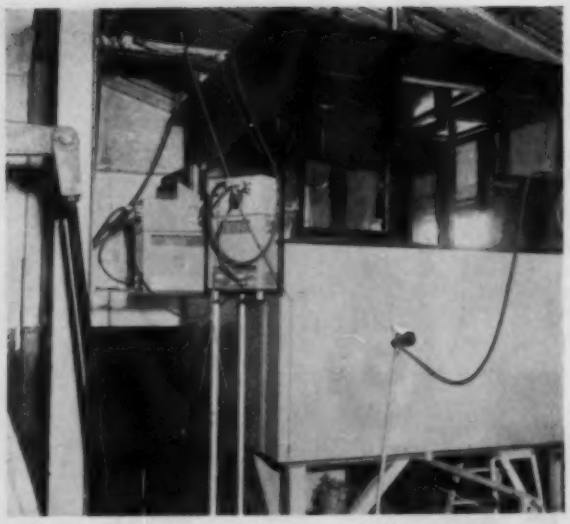


PLUG-IN SUBASSEMBLIES are quickly removed for substitution of components or repair of circuits. All units of system have same construction.

DRAWER CONSTRUCTION of control unit permits easy removal of chassis from cabinet for maintenance. Controls, tubes, connectors and fasteners are exposed.



DUMPING AREA, including chutes to bin, comes within range of television cameras on opposite side of coal hopper. Hoist operator can watch skip unloading.



COMPACT monitors and controls are mounted in front of hoist operator's control station. Quality of picture can be adjusted here, just like a home television set.

A SMOOTHER, SAFER JOB of hoisting, at lower cost, are top benefits resulting from the application of closed-circuit television at Peabody Coal's No. 17 mine, Pana, Ill. The closed system, first in the coal industry, permits the hoist operator to observe each loaded skip as it reaches the top of the headframe and is dumped into the raw-coal hopper. The operation is observed on the monitor.

The hoist man also can easily spot any large chunks that might be wedged in the skip. If a lump should remain wedged and be carried down to the automatic loading pocket, the skip will be overloaded the next trip because the automatic loading device at the shaft bottom delivers a definite weight of coal to the skip. A supposedly empty skip with one or more large chunks wedged in it will therefore be overloaded. As a result, the hoist will be out of balance and also overloaded. Now that the hoist operator can see the skip, this danger is eliminated. If the operator sees a lump wedged in the skip, he stops hoisting until a man can be sent to the dumping point to free it.

Another benefit of the television system is that the hoist operator can see whether the skip door recloses properly after discharging the load. An open skip door can cause costly delays if the skip is permitted to be lowered in this condition.

If the surge bin receiving coal from the skips becomes full, the hoist operator also can see that. He can either stop hoisting for a short interval or slow the rate of hoisting to correspond to the rate of feed to the preparation plant.

Before the television system was put in, a man was stationed at the bin to do all the jobs now done with the television system. If the bin became full, the man pushed a button that sounded a bell in the hoist operator's station. The observer later signalled the hoist man when the bin level had dropped enough to permit hoisting. Another duty of the observer was to watch for large chunks wedged in the skips. The television system now does the work formerly done by the observer.

A plug-in communication system is being added between the dumping point and the hoist operator's station. This will permit maintenance men at the bin to talk to the hoistman while camera adjustments or other repairs are made.

What the System Includes

Peabody's television setup includes two General Electric Type TE-3A closed-circuit television systems. The basic system, exclusive of accessories, is housed in three cabinets:

1. The camera, Type TG-2-A, which takes a picture of the skip unloading area.

2. The control unit, Type TH-5-A, which controls and transmits the picture.

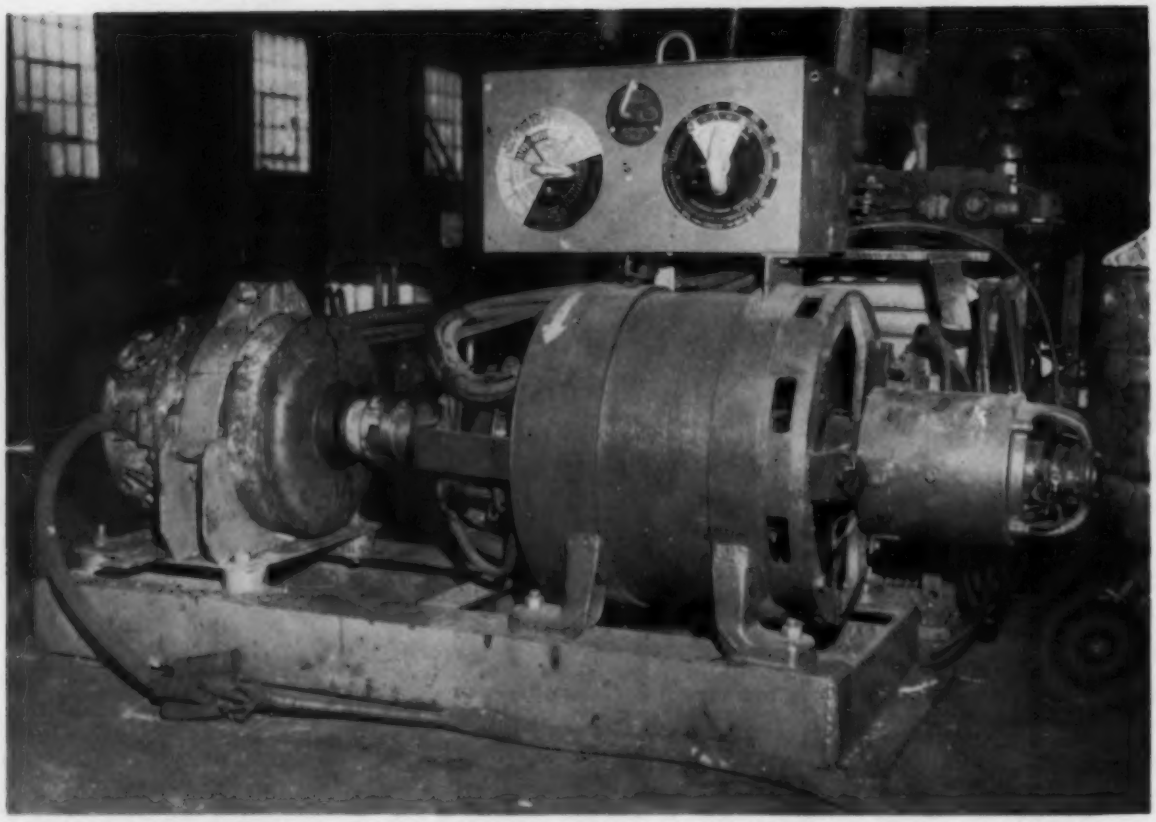
3. The monitor, Type TH-6-A, which displays the picture.

The camera is housed in a 12x12x32-in dust-tight cabinet. The control cabinet measures 9x15x20 in and is mounted on top of the monitor which has a 16x15x20-in cabinet. A 225-ft length of control cable links the camera with the control and monitor in the hoist house. The monitor produces an 8x10-in picture, the quality of which can be adjusted similarly to a home television set. Artificial lighting for operation in the dark is provided by three 750-w floodlights and 22 strategically located 150-w sealed-beam lights.

Maintenance Simplified

Units in the system are functionally divided into plug-in chassis or subassemblies. These can be quickly removed for substitution of components or repair of circuits. To simplify adjustments or replacement of parts, the camera cover slips off easily to expose the preamplifier chassis. The control-unit frame pulls off its cabinet on tracks, exposing all setup controls, tubes, connectors and chassis removal fasteners. The monitor can be withdrawn from the front of its cabinet for quick inspections.

Test points are provided on all units to facilitate adjustments and trouble-shooting. In the camera, control unit and monitor, all tube types and symbol numbers are marked and all controls are designated with descriptive names.



MULTI-MOTOR TESTER is designed to test series or compound DC or various AC motors whose full load speeds are approximately 1,800 rpm with horsepowers ranging from 5 to 20. Loads are varied by the shunt-field rheostat or by the reactor.

Dual-Purpose Unit Tests Motors and

Repaired motors should be tested before returning them to service. Here's how one electrical engineer built his own tester to reduce machine downtime and maintenance cost. It also serves as a welder for the shop.

IMPORTANT to all repair shops is a unit to test repaired or rebuilt motors. This need becomes greater now that mining has become a highly mechanized process which employs motors of all types and descriptions. Actually, few shops are equipped to test motors properly. Tests are usually limited to connecting and applying power to make certain they will run after being repaired, but that's not enough. Motors should be given thorough tests before they are installed on equipment that is expected to perform properly. These should include the following procedures and investigations:

1. Applying at least a 50% overload.

2. Reading the rpm of the motor with a tachometer to make sure it compares with the nameplate rating.

3. Checking motor bearings under load conditions with a stethoscope.

4. Conducting a heat test by running the motor at rated load for a specified length of time indicated on the nameplate.

Two very important benefits from such a test unit are:

1. Fewer breakdowns due to faulty motors.

2. Reduced maintenance and repair cost.

Recognizing this need, Wayne Myers, electrical engineer, Guyan Eagle Coal Co., Amherstdale, W. Va.,

SWITCHBOARD consisting of a voltmeter, ammeter, fuses and double-pole double-throw switch supplies power to test unit through a 5-conductor cable.

Serves as a Welder

designed a tester capable of supplying these benefits. An added feature is that it can serve as a welder.

Material used in constructing the unit includes a Lincoln-Stapel generator rated at 400 amp, 1,800 rpm; a shunt field rheostat, a current selector control or reactor, a voltmeter, an ammeter and the necessary metal.

The mounting base is designed to receive various adapter plates to permit testing different types of motors. These plates can be changed by loosening four bolts. One adapter is made to receive 24-, 38- and 40-J motor frames used on Joy equipment. A one-bolt strap acting as a vise is used to hold the motors securely. It also serves to hold the motors while inspection-port threads are retapped. The value of this feature can be appreciated after attempts are made to retap threads in a motor that is not held stationary. Other types of adapters are available to receive series or compound DC and various AC motors whose full load speeds are approximately 1,800 rpm with horsepowers ranging from 5 to 20.

Reliance motors using 20- or 21-tooth pinions need not have the pinions removed to mount them in the test unit. A half coupling has been made with an internal spline which slips on the motor pinion.

Power is supplied from a switchboard equipped with a double-pole double-throw switch, voltmeter and ammeter.

Leads from the switchboard to the motor have quick connectors. Slip-on insulating hoses for each lead help speed connections.

The purpose of the double-pole double-throw switch is to determine if the motor is wired for correct rotation. It should rotate in a clockwise direction indicated by the arrow on the generator after the switch has been placed in the downward position, as shown in the accompanying photo.

Generator power is fed through a stack of resistors located next to the generator fan, which helps keep the resistors cool.

The ammeter and voltmeter show the power input to the driving or test motor. This power can be varied by the generator shunt-field rheostat or by the reactor (current selector control) mounted on top of the generator. By loading the generator, the test motor load can be varied up to 250%. Motors are generally tested at 50% overload.

Using a Stethoscope

A stethoscope is used to test motor bearings under load conditions. It is placed on or as close to the bearings as possible. Defective bearings can be detected by this method which could not otherwise be found.

A hand held tachometer is used to obtain the rpm of the motor under test. The reading is taken by holding the tachometer on the end of the exciter shaft of the generator.

Special efforts are made to insure that all Joy head motors have the same rpm. Mr. Myers states that with the same input voltage and load, each head motor must have an rpm differential of zero compared with the nameplate rating before it passes the test.

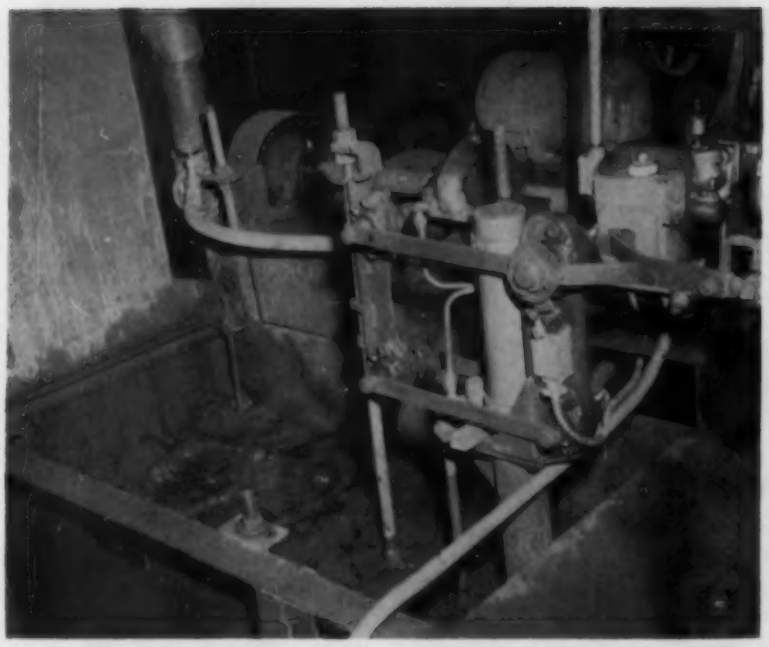
Equipment from five different mines is reconditioned at the central shop. All motors from this equipment are repaired and tested as described above.

Since this method of testing motors has been in effect, the following faults have been found in motors:

1. Brushes not seated properly.
2. Commutators out of round.
3. Rotation wrong.
4. Series fields bucking shunt fields.
5. Shunt fields open.
6. Interpole polarity wrong.
7. Defective bearings.

If these motors had not been tested before they were installed on equipment they would have failed in short order, adding to downtime and maintenance cost.

While the unit is not being used for testing purposes it can serve as a welder. When using it as such, a compound motor rated at approximately 1,800 rpm is used to drive the generator.



FINE-COAL JIG is conventional piston-type unit with reject gate similar to modern Baum jig. Bed of plant refuse is controlled by automatic float.

Using bed material from the regular plant circuit, a new jig developed by E. H. Citron, mechanical engineer, Pittsburg & Midway Coal Mining Co., eliminates need for feldspar or other artificial bed material. Piston-type unit is highly adjustable.

New Fine-Coal Jig Cleans ¼x0

THE FIRST fine-coal jigs to operate without an artificial bed now boast nearly 3 yr of efficient performance at Pittsburg & Midway's preparation plants. Developed in 1955 by Elmer Citron, Pittsburg & Midway's mechanical engineer, the fine-coal jigs now are in service at three of the company's plants.

Receiving a feed with 25% ash, the new jig turns out a product with 8% ash at the company's new DeKoven mine. At other plants, raw feed contains up to 38.2% dry ash, the clean product has 7.5% ash. Details of several tests on jig performance are shown in accompanying tables.

Developing the Jig

It has always been the company's belief that a small piston-type jig

Tables show how the fine-coal jig performed in three different tests

Test No. I

Jig Feed:

¼mmx0 underflow from seven 14-in cyclones plus ⅛x0 refuse from Rheo fine-coal washer

55% 1.40 Float in Feed
Raw Ash 38.3%
Dry Ash 7.5%, 1.40 float
Capacity, 10.8 tph

Jig Product Analysis:

Mesh	% Wt.	Dry Ash	Accum. Ash
+6	2.2	5.1	5.1
6x8	3.4	5.3	5.2
8x10	2.4	5.7	5.3
10x18	19.1	6.2	5.9
18x35	44.8	8.1	7.2
35x60	24.2	17.0	9.7
60x100	3.4	26.0	10.2
−100	.5	34.6	10.4

Jig Refuse, 10% 1.40 Float
Dry Ash on Float, 8.5%

Test No. II

Same Feed as Test No. 1

56.6% 1.40 Float in Feed
30.4% Raw Ash
10.21% Dry Ash on 1.40 Float
Capacity, 11.3 tph

Jig Product Analysis:

Mesh	% Wt.	Dry Ash	Accum. Ash
+6	2.6	8.55	8.55
6x8	3.8	9.27	8.90
8x10	2.5	9.38	9.20
10x18	19.3	10.11	9.8
18x35	42.9	11.2	10.6
35x60	14.7	16.28	11.6
60x100	12.9	22.7	13.0
−100	1.4	30.05	13.3

Refuse, 15.6% 1.40 Float
Refuse, 11.23% ash on 1.40 Float
Refuse Raw Ash, 45.93%

Test No. III DeKoven Mine

Screen Analysis of Feed

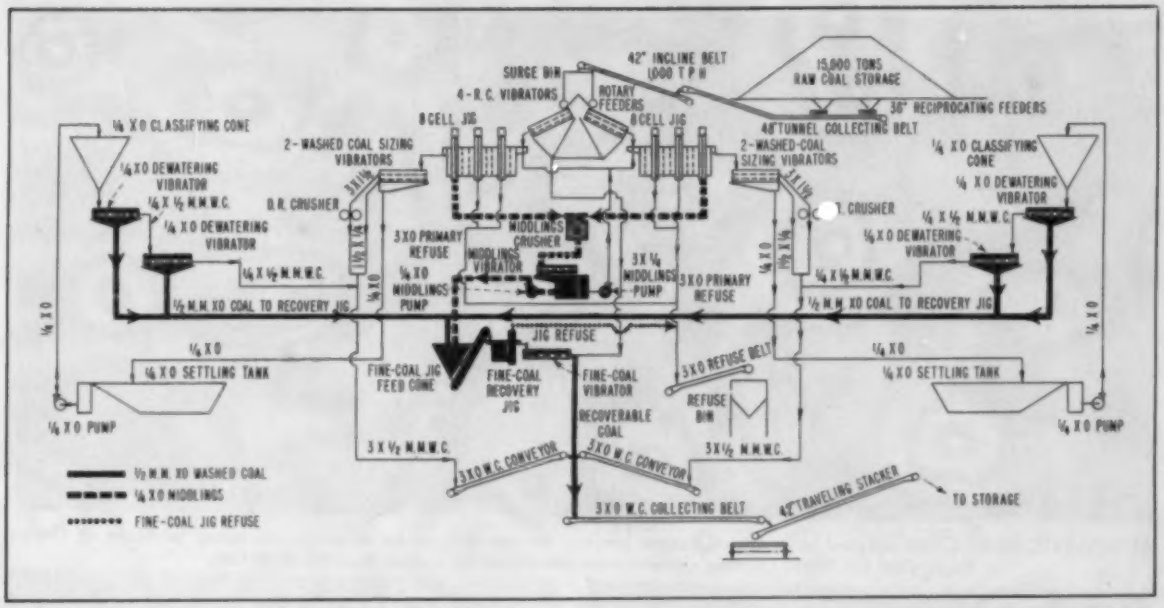
Screen Size	% Wt.	% Ash	Accum. Ash
Plus 5 Mesh	21.05	28.03	28.03
5x9 Mesh	15.79	28.60	28.27
9x16	12.28	27.20	28.01
16x32	26.32	15.98	23.81
32x60	17.54	21.62	23.40
60x0	7.02	49.46	25.23

Screen Analysis of Product

Screen Size	% Wt.	Screen Size	% Wt.
Plus ¼ in	1.74	14x16	3.96
¼x⅛	5.22	16x28	22.71
⅛x8 Mesh	12.06	28x48	31.26
8x10 Mesh	9.16	48x100	5.53
10x14	7.61	100x0	.75
Total			100.0

Laboratory Analysis of Product

	As Received	Dry Basis
Total Moisture	32.16%	...
Total Ash	8.05	11.86%
Sulphur	2.88	4.24
Btu	8,725	12,861


42" INCLINE BELT 1000 T P H
15,000 TONS RAW COAL STORAGE
SURGE BIN
4-R.C. VIBRATORS
ROTARY FEEDERS
36" RECIPROCATING FEEDERS
8 CELL JIG
8 CELL JIG
48" TUNNEL COLLECTING BELT
¼ X 0 CLASSIFYING CONE
2-WASHED COAL SIZING VIBRATORS
2-WASHED-COAL SIZING VIBRATORS
¼ X 0 CLASSIFYING CONE
¼ X 0 DEWATERING VIBRATOR
¼ X 0 DEWATERING VIBRATOR
D.R. CRUSHER
D.R. CRUSHER
¼ X 0 DEWATERING VIBRATOR
¼ X 0 DEWATERING VIBRATOR
3 X 0 PRIMARY REFUSE
MIDDLINGS CRUSHER
MIDDLINGS VIBRATOR
¼ X 0 MIDDLINGS PUMP
3 X ¼ MIDDLINGS PUMP
3 X 0 PRIMARY REFUSE
½ M.M. X 0 COAL TO RECOVERY JIG
½ M.M. X 0 COAL TO RECOVERY JIG
JIG REFUSE
¼ X 0 SETTLING TANK
¼ X 0 SETTLING TANK
FINE-COAL JIG FEED CONE
FINE-COAL RECOVERY JIG
FINE-COAL VIBRATOR
3 X 0 REFUSE BELT
REFUSE BIN
RECOVERABLE COAL
¼ X 0 PUMP
¼ X 0 PUMP
3 X ½ M.M.W.C.
3 X 0 W.C. CONVEYOR
3 X 0 W.C. CONVEYOR
3 X ½ M.M.W.C.
3 X 0 W.C. COLLECTING BELT
42" TRAVELING STACKER
TO STORAGE
½ M.M. X 0 WASHED COAL
¼ X 0 MIDDLINGS
FINE-COAL JIG REFUSE

FINE-COAL FLOW to new jig at Pittsburg & Midway's DeKoven plant includes ½mmx0 from dewatering screens plus ¼x0 middlings. Sizes are blended in feed cone before passing to jig. Two jigs process 25 tph each of coal containing 25% ash.

could be developed to clean fine ¼x0 coal down to 28 to 60 mesh efficiently by obtaining and admitting bedding material from the plant refuse circuit to the jig feed. Thus the need for artificial bedding materials, such as feldspar, would be eliminated.

After much study and experimenting, the fine-coal jig using plant refuse was developed under the direction of Mr. Citron. It offers the following advantages:

1. It is a conventional piston-type jig using the regular plant feed as bed material.
2. The reject gate is similar to a modern Baum jig. The bed is controlled by an automatic float also similar to that in a Baum jig.
3. The unit is highly adjustable.

To make the jig readily adjustable, it includes the following features:

1. Sieve screen can be raised, lowered or set at any angle.
2. Baffle plate between piston and sieve compartments can be adjusted to maintain uniform water distribution over the entire sieve screen.
3. Reject orifice can be adjusted to any size opening.
4. Stroke adjustable by means of an adjustable eccentric.
5. Eccentric speed can be varied by variable-speed drive.
6. Water enters below and above plunger and can be adjusted at both points.
7. Hutch material flows by gravity into elevator boot and jig has conventional elevator for handling refuse.

Early Tests

The first one-cell experimental jig incorporating all of the features was built in January, 1955 by Ore Reclamation Co. of Picher, Okla. under the guidance of Pittsburg & Midway's engineers. This unit was installed at the company's No. 19 plant in Kansas on an experimental basis. There it was set up to handle 20 to 22 tph of material made up of underflow from five 14-in Heyl & Patterson cyclones and the refuse from the Rheolaveur washer handling ⅛x0. The combined feed contained 45 to 55% minus-28-mesh material, 50% of which floated at 1.40 sp gr with a dry-ash content of 10.2%. The raw feed contained 38.2% dry ash.

Results from the early tests with this experimental jig were better than the company expected. An analysis of jig performance showed that the unit performed most efficiently on sizes larger than 35 mesh. This represented 75 to 80% of the total jig product.

To find the best operating conditions for the new jig, several combinations of number of strokes per minute and length of stroke were tried. The number of strokes varied from 50 to 200 per minute and lengths ranged from ¾ to 2 in. Best results were obtained with the jig operating at 70 strokes per minute and with a 1-in stroke. This combination of number of strokes per minute and length of stroke, says Mr. Citron, does not agree with technical papers written on fine-coal jigging or with authorities on the fundamentals of jigging.

The cell compartment is 2 ft wide and 3 ft long, giving 6 sq ft of sieve area. Jig capacity varies from 2.5 to 4 tons per square foot of sieve area and depends on the characteristics of the coal being treated.

DeKoven Results

At the DeKoven plant the feed to the jigs is made up of primary and secondary components. The primary portion comes from the ½mmx0 underflow from four 6x16-ft Robins vibrating screens that dewater the ½x0 washed coal. The vibrators are equipped with ½mm Bixby-Zimmer screen. The secondary portion consists of middlings, from two Jeffrey wash boxes, which are crushed to 1½x0 and discharged onto an Allis Chalmers vibrator equipped with ¼-in Bixby-Zimmer screen. The ¼x0 material flows to a sump pump and is delivered to the fine-coal jig feed cone where it is blended with the primary feed.

The product from the fine-coal jigs passes over a 5x14-ft Robins Dewaterizer equipped with ¼mm Bixby-Zimmer screen. The clean recoverable coal from this unit flows by gravity to the 3x0 washed-coal collecting belt conveyor. Details of the fine-coal jig circuit are shown on the flow sheet. There are two of the fine-coal jigs operating at the DeKoven plant. Each of these handles 25 tph of feed. A complete description of the DeKoven mine and preparation plant appeared in the June issue of *Coal Age*, p 74.

AUTOMATIC RERAILERS installed at strategic locations prevent serious damage by derailed cars along haulways at Guyan Eagle Coal Co. Three different designs were developed for various haulage conditions.

Rerailer Prevents Costly Wrecks

An automatic device capable of rerailing cars at high speed reduces lost tonnage, expensive repairs and extra labor cost caused by mainline wrecks.

"COSTLY MAINLINE haulage wrecks at our mines are becoming more infrequent since we started using a new type automatic rerailer," says H. B. Ferguson, superintendent, Guyan Eagle Coal Co., Amherstdale, W. Va. The rerailer, designed by Mr. Ferguson, was adapted to the haulage systems of the Nos. 1 and 3 mines but can be used at any operation.

An automatic rerailer that actually works can do wonders for your haulage system by reducing the number of wrecks. Regardless of how good your track may be, cars will derail. If these cars are not rerailed quickly, the results, in most cases, are lost tonnage, expensive repairs and added labor cost. These are high prices to pay for wrecks that might otherwise have been no more than off-and-on derailed cars. Quite often the cost of one wreck would pay for installing several of the company-designed automatic rerailers.

Types of Rerailers

There are three types of rerailers used at Guyan Eagle:

1. A fast haulage type used on mainlines where high speed transportation in both directions is possible.
2. A slow-fast type used to take care of fast haulage in one direction and slow haulage in the other.
3. A dump type used on the empty side of the car dump to make sure that all cars entering the empty loop are on the track.

Construction and Installation

Construction of these rerailers is essentially the same. The chief advantages of having three types are reflected in the amount of material used and the installation cost of each.

Material used consists of 4- and 3-in lumber, switch ties, ¼-in sheet metal, scrap rails, spikes and bolts.

Each rerailer is custom-made. Individual parts are made and assembled in the car shop. After one has been completed, it is disassembled, taken inside and permanently installed in the track. The reason for this is to reduce installation time by having the parts fit correctly.

The first step is to take two rails and make the necessary bends. The fast haulage type requires two 18-ft-long rails and the slow-fast, two 12-footers. It is important that the two rails match after they are formed. When completed the ends of each rail will meet, forming a sort of diamond shape, as shown in the illustrations. The first bend is made 8 ft 4 in from the end, the next 16 in from the first bend. This makes one straight section 16 in long in the center of the rail with an 8-ft 4-in section on each side of the straight section.

Before the rails are spiked down, half the bottom flanges of the straight sections are cut off with a torch so that the gap between the main rails and the guide rails will not be too wide. Two bolt holes are made in the rail 9 in apart in the straight section and also in the main rail. A spacer is placed between the two and they are then bolted together. The ends of the rails are sloped in much the same manner as machine jacks. This keeps objects from catching on the ends and pulling the rails out. The ends are then bolted together and the center guide rails are spiked to the switch ties.

The second step is to floor the section between the main rails with 3-in lumber. The floor on each end of the rerailer is sloped from 3 in to ½-in in a length of 58 in. It is then nailed to the switch ties. To complete the center section, ¼-in sheet metal is placed on top and anchored to the wood. This metal protects the wood and also helps the derailed cars slide into position for rerailing.

The outside sections of each re-

PERMANENTLY INSTALLED device rerails cars at fast speed (left) and slow speed (right). Fast-haulage rerailers have long guide rails on both ends.

SPECIAL-TYPE rerailers at car dump keep derailed cars off the empty loop.

FOUR-WHEEL WRECK (left) is put on as car travels over rerailing device. Cars are usually rerailed before the motorman knows that they left the track. Devices are located so that cars are rerailed before they reach intersections.

railer are the same. A straight rail 69 in long with half of the bottom flange cut off is placed alongside the ball of the main rail and welded, top and bottom. This rail must be placed between the slopes of the flooring to protect the wood and metal flooring from double flanged wheels. The outside flooring is the same as the inside except 4 in lumber is used to make the floor even with the top of the main rails. It is also covered with ¼-in sheet metal.

Slow-fast rerailers are constructed in the same manner except that dimensions are different. The length of the slow haulage end is shorter than the fast haulage end.

The dump type rerailer is quite different from the others. Although the flooring is installed in the same manner the rerailing parts are different. Cars travel in one direction on the empty side of the car-dump and rerailing facilities only need to be one way. This is accomplished by having two short curved sections of rails mounted along the outside of each main rail to guide the derailed cars toward the center (see illustration). The ball on each main rail is cut off at the same angle as the curved section mounted on the outside to permit the flanges of the wheels to travel to the inside of the track, thus rerailing the cars.

How Rerailers Work

The fast-haulage rerailers work very well on level track and where conditions permit traveling at high speeds in either direction. Usually, they are located near intersections where a derailed car might tear out a switch or cause other cars to derail. The purpose is to rerail cars before they reach the intersections.

Slow-fast rerailers perform better on grades. Cars traveling upgrade, at a slower rate of speed and with linkage between cars extended, can be rerailed in less distance than those traveling fast and with no linkage between cars. Downgrade or fast haulage operation of this rerailer is the same as for the fast type.

The dump-type rerailer is designed to rerail empty cars coming from the car dump. It cannot stand up under loaded cars or cars traveling at high speeds. Cars are emptied, coupled together and controlled by a retarder which eases them onto the empty loop. If an empty leaving the dump to be coupled hits the trip too hard it might wreck. When this happens the car is rerailed as it travels over the rerailer. The dumping operation is not stopped to put the car back on the track.

An efficient haulage system is important to any operation. And, since rerailers have improved haulage so much at Guyan Eagle, officials plan to install one a week until the systems at Nos. 1 and 5 are completely equipped.

NEW ENTRY in overburden drilling bores a 9-in horizontal hole to a depth of 48 ft without adding drill stems. Operating one full and one part-time shift, the drill keeps pace with a 40-yd shovel moving 1,195,000 cu yd per month.

New Horizontal Overburden Drill Increases Stripping Efficiency

Drilling 9-in holes 48 ft deep without adding drill sections and at a rate of 50 in per minute in a one-man operation are the results of Peabody's search for more efficient equipment.

DRILLING CAPACITY to keep up with a 40-yd shovel moving 1,195,000 cu yd of overburden per month and one-man operation are highlights of a new horizontal rotary dry-type overburden drill at Peabody Coal's Victoria mine, Boonville, Ind. The machine incorporates the principles of the vertical type drill. Working one full and one part shift six days a week, it drills enough holes for uninterrupted, round-the-clock shovel operation, seven days a week.

A single drill stem, 60 ft long, is mounted lengthwise on a sliding boom. The drill stem is hydraulically fed ahead 9 ft at a time and permits a 9-in hole to be bored 48 ft deep without adding drill sections. Equipped with a Hughes 9-in oilwell-type Tricone bit, the unit penetrates shale at rates up to 50 in per minute. In the best single shift 17 holes, or 816 ft of 9-in holes, was drilled by one man.

Drill Development

Development of the new drill—a Joy 398SB—is the result of constant search by Peabody officials for new, more efficient equipment and the desire of manufacturers to fill those needs. Fred Horne, Peabody blasting superintendent, and Paul Duensing, erection superintendent, cooperated with Joy design engineers in the development of the drill.

The idea behind the development of the drill was to take the principles of vertical rotary dry-type machines and incorporate them into a horizontal machine. Late in 1954 the first version of the horizontal rotary machine went into operation at Peabody's Seminole mine. There it drilled 7⅞-in holes in the limestone covering the Illinois No. 6 coal.

Although very little was known about this method of drilling, the results quickly showed that it was practical. At first auger sections 9 ft 2 in long were used. But these were later replaced by smooth stems except for the section following the bit. Other changes were made to improve the drill's performance but the major disadvantage that could not be overcome was the time consumed in handling auger sections.

One drill helper, using an electric hoist, could make and break the stem connections. But these two operations took nearly as much time as the actual drilling. To eliminate this unproductive work it was decided to replace the short sections with a single stem long enough to drill a complete hole. This would not only eliminate the unproductive time but also make possible one-man operation. The original drill then was modified to use a 60-ft stem. The first 12 ft of stem were fitted with a scroll, the remainder left smooth. This change was made in 1956 and the drill was moved to Peabody's Victoria mine where it is

today. The 60-ft stem permits a 48-ft hole to be drilled.

Overburden at Victoria is fairly soft shale but there are many small, hard inclusions in it. Since as much as 75 ft of cover is removed the company decided that a larger bit would be needed. As a result, the 7 ⅞-in bit was replaced with a 9-in unit. After only a few weeks operation at Victoria, the practicability of the drill and the use of comparatively short horizontal holes in deep overburden was demonstrated. On the basis of these results the company decided to make some more major refinements on the drill, chiefly to increase the speed of a few operations and add some improvements that would ensure one-man operation.

Design Features

The new drill consists of a crawler-mounted steel frame, operator's cab, four 12-in hydraulic leveling jacks, drill-stem boom, rotary drive mechanism, hydraulic system, air compressor and power transformers. Total weight is about 55 tons.

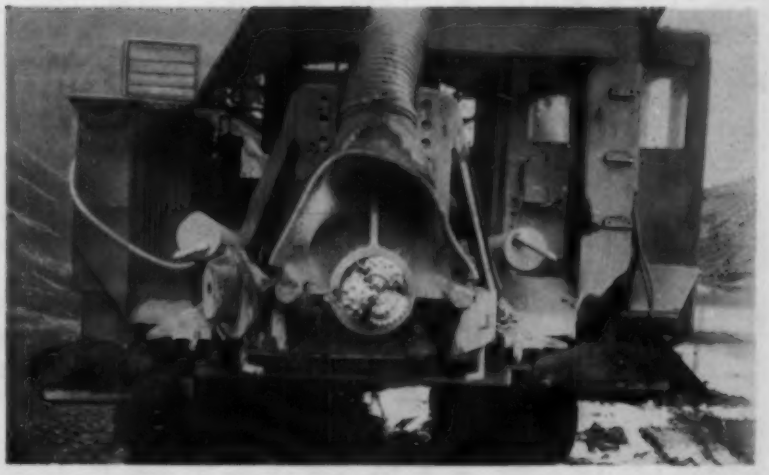
A total of 245 hp is needed to power the various components of the drill which are driven by electric motors. Electric energy is delivered to the drill at 4,160 v and reduced to 440 by two General Electric transformers mounted on the drill.

The drill rotation is powered by a 50-hp Reliance motor which is connected to a speed reducer by a fluid coupling. The speed reducer in turn drives a 5-speed transmission connected to the drill chuck. In high gear the bit makes 150 rpm. The drill chuck has movable jaws which are hydraulically operated to grip the drill stem as it is fed ahead 9 ft at a time. The rotary stem drive is slide mounted lengthwise in the drill frame.

Drill cuttings are flushed out by compressed air that enters the hole through the hollow drill stem. Fine dust is collected by a Rotaclone. Air is supplied by a Joy Model E Class WM-102 compressor and is transmitted to the stem through a 2-in hose which is attached to an air swivel at the end of the drill stem. The compressor is driven by a 125-hp Reliance motor.

Each of the crawlers is independently controlled and may be run in opposite directions for fast maneuvering. Crawlers are chain driven through individual speed reducers powered by 20-hp motors.

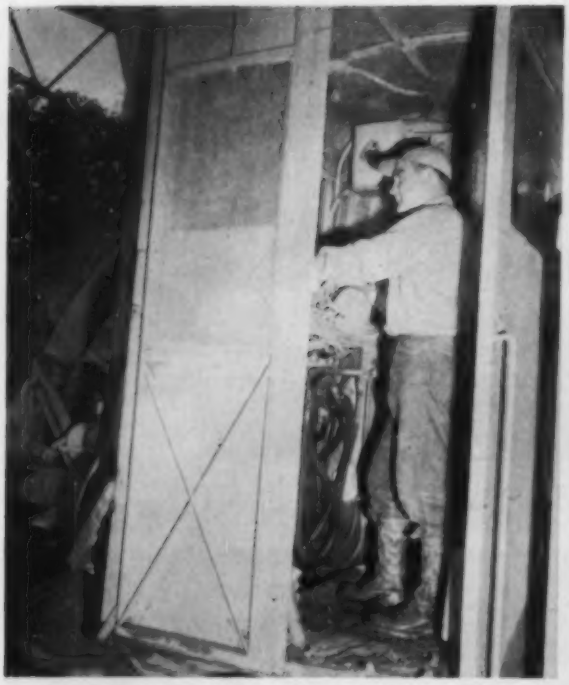
The four 12-in hydraulic jacks are used to raise and level the unit before drilling. Each has a universally mounted pontoon base that provides a maximum of bearing surface and



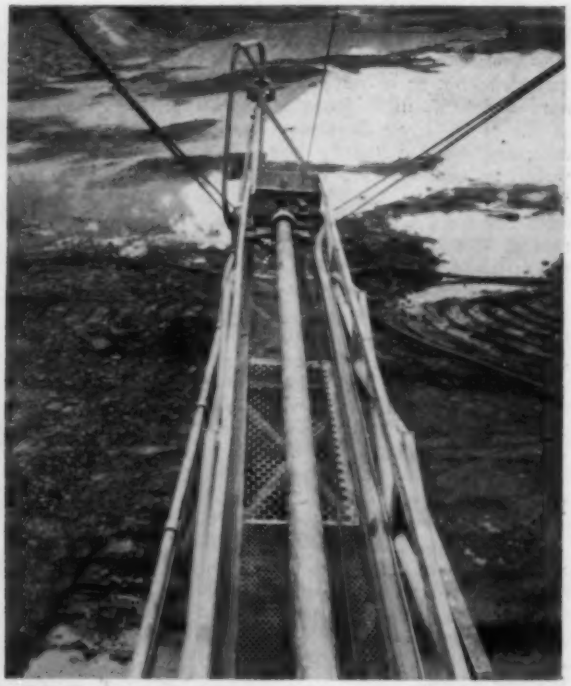
A 9-IN HOLE is cut with oilwell-type bit. Cutting head drills 18,000 ft of hole in shale formation before wearing out. Speed of rotation is 150 rpm.

DRILL CHUCK mounted at front end of feed carriage grips drill stem with hydraulically powered jaws. Stem is fed 9 ft at a time.

DRILL CUTTINGS are sucked up in vacuum-cleaner fashion as they are flushed out of hole by air. Cuttings make excellent stemming.



DRILL OPERATION and control are centered in cab at front end where one man controls all motions.



BOOM at rear of chassis supports drill stem. Air enters hollow stem through an air swivel attached to end of it.

stability on uneven ground. The jacks can be extended 24 in.

The hydraulic system performs four important jobs: (1) feeds the drill stem; (2) raises and levels the machine to drilling position; (3) operates the drill chuck; and (4) retracts the drill stem when the hole is complete. The entire hydraulic system is powered by a 30-hp Reliance motor.

Drill Advantages

When the drill cuts through solid material for the full depth, the hole is extremely clean. The clean, smooth holes permit easy loading of explosives with diameters only slightly less than the hole. This makes possible concentration of explosives toward the back of the hole and a correspondingly longer column of stemming.

Holes are drilled straight and smooth and do not drift in the direction of rotation as auger-drilled holes do. Drill cuttings, removed from the hole by air, make excellent stemming material.

Drilling and Blasting

The drill now is working in an area with comparatively thin cover only 30 to 40 ft thick. But this condition is unusual and overburden ranges up to 80 ft thick. Holes are bored level on 30-ft centers in the thinner 40-ft cover. As a general rule, however, hole centers depend on the overburden ratio. For example, spacing is reduced to 20 ft in thicker material and alternate holes are angled upward.

POWER for operating electric motors totaling 245 hp is reduced to 440 v by transformers on side of drill.

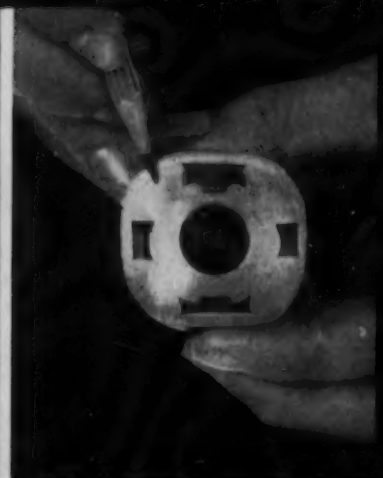
Holes are charged with an ammonium nitrate explosive in the ratio of 5½ to 1. The blasting agent is delivered to the property in special burlap bags with a plastic interliner. The company reports that this type of container yields a more solid package that is easier to load into blastholes. Each hole is primed with 12 lb of Olin 60% gelatine.

Holes are laced with Primacord and 17-MS delay connectors are used between holes. Up to 45 holes are set off in one blast. The 48-ft holes break enough back rock to permit the 40-yd stripping shovel to uncover a 65-ft strip of coal.

Here's what to look for in a Shell and Plug...

1 Two-piece shell of O-B Bail-Type flexes easily, doesn't resist expansion forces created by bolt tension. Result is a quick-setting unit with more useful expansion force per ft./lb. of torque.

2 Three-step taper in O-B plug is designed to take up the slack in the bolt hole fast, develop a powerful "socket" anchorage, prevent high unit stresses at extreme top edge of plug.



3 Horizontal section of expanded O-B unit shows four-way expansion of shell fingers. Four-way distribution of stress permits high loading without distorting plug or pinching bolt threads.

4 Vertical section of expanded O-B unit shows solid "stack-up" of metal in bolt, shell, and plug. This solid metal contributes to superior strength of the socket formed by the plug.

5 Sectioned pieces of expanded O-B unit show heaviest markings in middle or "socket" area of plug. Lighter markings at top of plug prove excellent stress distribution at point of greatest expansion.

6 Section of steel pipe in which O-B unit was expanded for test shows that expansion forces are distributed evenly over all four shell fingers. Serrations on shell fingers make clean sharp impressions.

and here's the place to find it →

OHIO BRASS COMPANY · MANSFIELD, OHIO

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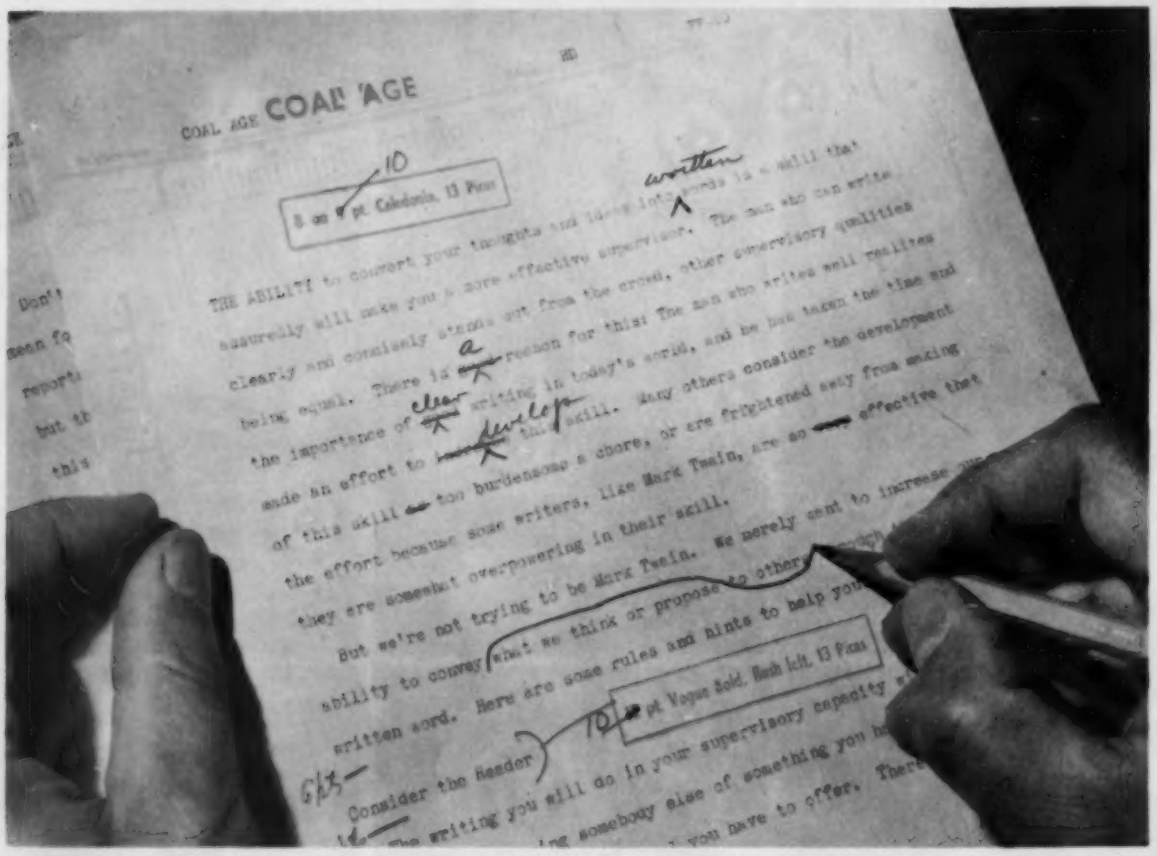
O-B

SHELLS AND PLUGS

4806

Foremen's Forum



THOROUGHLY REREAD what you have written to make sure you have used the words you intended to use to convey your meaning and to "weed out" meaningless words. Consider the needs of your readers, and write with a prepared outline at hand.

Report Writing for Supervisors

You can become a more effective supervisor as you increase your ability to write clearly and concisely.

Here are some suggestions to help you organize your writing chores and to increase your word power.

THE ABILITY to convert your thoughts and ideas into written words is a skill that assuredly will make you a more effective supervisor. The man who can write clearly and concisely stands out from the crowd, other supervisory qualities being equal. There is a reason for this: The man who writes well realizes the importance of clear writing in today's world, and he has taken the time and made an effort to develop this skill. Many others consider the development of this skill too burdensome a chore, or are frightened away from making the effort because some writers, like Mark Twain, are so very effective that they are somewhat overpowering in their skill.

But we're not trying to be Mark Twain. We merely want to increase our ability to convey to others what we think or propose through the medium of the written word. Here are some rules and hints to help you.

Consider the Reader

The writing you will do in your supervisory capacity will have the purpose of informing somebody else of something you have done, some decision you have made or some proposal you have to offer. Therefore, your first thought in putting pencil to paper must be one of consideration for the man who will read what you have written. Write with your reader in mind. Tell him all he needs to know if he is to fully understand what you are thinking or proposing. Then read again what you have written. Strange to say, it is possible to write the reverse of what you are thinking. *(Continued on page 104)*

Here's one way to reduce your mine power feeder costs

Many systems permit use of Rome's less expensive MPT cable

When you have a power supply system that's designed for relatively steady loads and protected against excessive overloading, you can save money on your mine feeder installations by purchasing Rome's MPT—a cable that's custom-made for this type of installation.

Rome's MPT is a special kind of thermoplastic cable that's designed to give you real economy, including low initial cost. Compared to rubber and neoprene cables, it's smaller in diameter and weighs less—these features lead to easier handling and less expensive fittings. And this tough cable lasts longer because the Rolene (polyethylene) insulation and special Roseal (flame-retardant polyethylene) jacket combine to give you outstanding resistance to chemicals, moisture, and abrasion.

You can make this economical choice with full confidence. Rome's MPT is designed and built for *safe* operation. Individual copper shielding of power conductors furnishes ground fault protection. And bare ground wires —in direct contact with the shielding—provide a low-resistance circuit in the event of ground faulting of equipment.

Rome MPT can be used in boreholes, shafts, trays, aerially, or underground. Sizes range from 8 AWG to 250,000 CM. A three-conductor cable, it's rated up to 5,000 volts.

Specify Rome MPT for your next job. For further information, contact your nearest Rome Cable representative—or write to Department 752, Rome Cable Corporation, Rome, N. Y.

ROME CABLE

CORPORATION

We think most of your writing will be in one of two forms. Either you will complete a standard report form provided by your company or you will start from scratch to compose a full write-up of an idea or observation. Both require extreme care in preparation.

Don't pass off the standard form as an unimportant piece of writing. We mean forms such as inspection reports, daily tonnage reports and maintenance reports. Entries you make on reports like these must be accurate and complete, but they must also be concise. Don't use many words where few will do. In this regard, note how many times you can strike out the word "the" without harming the meaning of what you have written.

We stress the word accuracy in your approach to filling out standard forms. Take the view that any report you file may someday become evidence in a court of law. And that might conceivably happen. Also, a note of caution: Don't cut the heart out of statements or affadavits that must be written in a certain way to satisfy legal requirements, as in the fireboss' book.

The other type of writing you may wish to undertake is the preparation of a full write-up of one of your suggestions or ideas. This is not too difficult if you approach the task as you would any other job. This means following certain accepted and proved principles to get the job going and to keep it moving.

Preparing Your Outline

You can't tell the players without a program; you can't take a trip through strange country without consulting a road map and setting a course, and you can't do a good job of writing without an outline, perhaps in your head but preferably on paper. Here are some suggestions, assuming you are writing a piece through which you hope to sell an idea or suggestion to your superiors.

Stress the benefits. Every reader of your composition will want to know right now what advantages your idea or suggestion will provide if it is adopted. Your busy boss does not have the time to wade through a lot of wordage to get your evaluation of these advantages, and he is even less inclined to dig them out himself if they are merely inferred. So state them plainly right at the beginning.

Your superior will not be the only one to read your writing if he becomes the least bit excited over the possibilities in your idea or suggestion. He will pass it along to the department head who is most concerned. For example, if you suggest a mechanical improvement, the "big boss" will take a long look at the benefits and perhaps a faster look at the remainder of your report, and pass it along to the master mechanic for his evaluation. Now you have a new reader to consider. The master mechanic also will be interested in having the advantages presented first, but then he will go deeper into the following material to learn more of the particular applications of your ideas, the materials needed to make it a reality and the estimated cost.

He and the operations chief may agree that your idea is well worth adopting, and now your composition will be passed along to a third reader, the machinist or other skilled workman who will build the working model. Now your newest reader will need detailed instructions, including sketches possibly, to guide him as he builds. (Actually, the master mechanic may pass these instructions along verbally, but let's not quibble. We're trying to make the point that what you write may have several different readers, all having different interests which must be satisfied.)

There are more formal types of reports which we prefer to keep beyond the scope of this month's discussion. However, the foregoing suggestions may be sufficient to permit us to lay down a few fundamentals for the supervisor about to write up an idea to be sent through channels.

1. Know your subject. Jot down pros and cons that might affect acceptance of your idea and make provisions for resolving these in your write-up.

2. Know your readers. Establish in your mind the identities of the different people who will read what you are writing, then be sure to include all the pertinent facts each will need.

3. Prepare an outline. It's much easier to write from your full knowledge of your subject and readers if you have a good outline at hand.

4. Proofread your composition. Read your completed report thoroughly to make certain it says exactly what you mean.

Words as Tools

Clear writing demands the use of the proper word in the right place. As you increase your writing ability you can also increase your aptitude for selecting the one best word to express a specific thought, if you will make the effort to do so. In an article entitled, "A Leader Must Have Word Power," in the September, 1957, issue of *Industrial Supervisor*, a National Safety Council publication, David B. Guralnik, general editor, Webster's New World Dictionaries, presents five guiding principles, as follows:

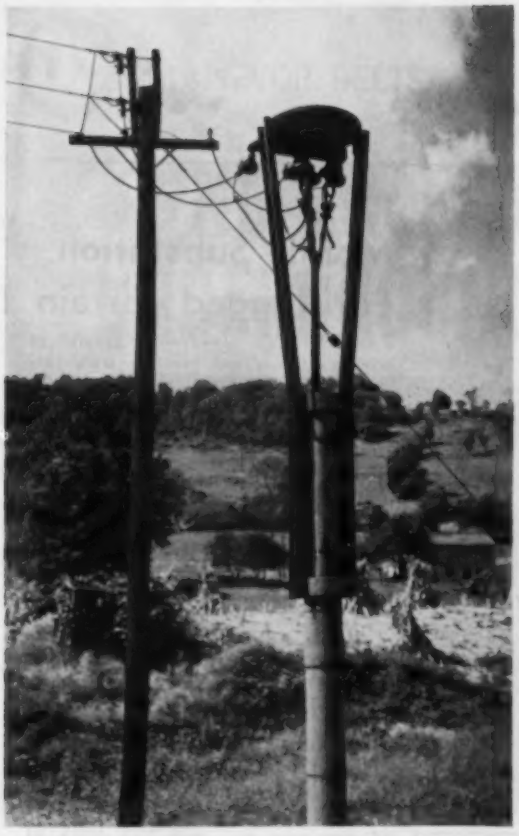
1. Get the "dictionary habit." When you read or hear an unfamiliar word, look it up in a reliable dictionary. Never be satisfied with guessing at the meaning—make sure. Familiarize yourself with its spelling, pronunciation and all its possible meanings.

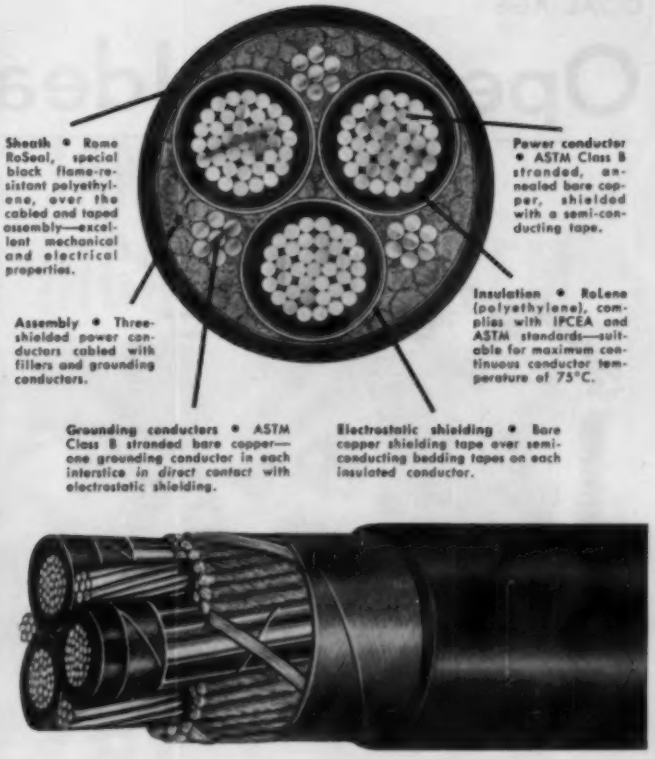
2. Favor precision over bombast. It's more desirable to say just what you mean than to smother your thoughts under big words. To gain precision you will have to consult your dictionary often. And if you don't already own a thesaurus (a book of synonyms and antonyms arranged for easy reference), you should. Take a simple word like *say*. Look up *utter, blurt, affirm, declare, profess* and *allege*. Notice how many shades of say there are. Do that with more and more words. You'll be amazed at how your vocabulary will take on precision.

3. Learn to respect and enjoy words. Make them a hobby. They can be fun. What we call an apple started out as "a napple," but the "a" took the "n" to itself, and what custom put together, no man has since put asunder. Words big and little have their biographies and when you get to know them, the words become old and familiar friends with which you associate more easily and admiringly.

4. Learn to analyze words. Most words can be broken down into their component parts and understood that way. The beginning of a word—the prefix—is often a clue to its meaning. Learn the meanings of the most common prefixes and you have a powerful vocabulary aid. *Ante-*, for example, means "before." *Anti-*means "against." *Inter-* means "between." *Ex-*stands for "out of." Knowing these and others will help you make intelligent guesses of words' meanings, until you can check with a dictionary. Then learn the more common suffixes (word endings like *-ment, -ible, -tion,* and *-ous*) and you'll be well on your way toward an expanding vocabulary.

5. Draw on your background. If you're of French, Spanish, Portuguese, Italian or Romanian descent and are familiar with your ancestral tongue (or studied any of these languages in school), you have a vocabulary advantage. They are all descendants of Latin, the language of ancient Rome; hence their name—Romance languages. More than half of the English language derives from Latin too, directly or indirectly. Thus, these languages have much in common. If, for example, you know that the French word for "friend" is *ami*, you should know the meanings of such English expressions as *amiable, amicable* and *amity*.




Sheath • Rome RoSeal, special black flame-resistant polyethylene, over the cabled and taped assembly—excellent mechanical and electrical properties.
Power conductor • ASTM Class B stranded, annealed bare copper, shielded with a semi-conducting tape.
Insulation • RoLene (polyethylene), complies with IPCEA and ASTM standards—suitable for maximum continuous conductor temperature of 75°C.
Assembly • Three-shielded power conductors cabled with fillers and grounding conductors.
Grounding conductors • ASTM Class B stranded bare copper—one grounding conductor in each interstice in direct contact with electrostatic shielding.
Electrostatic shielding • Bare copper shielding tape over semi-conducting bedding tapes on each insulated conductor.

Rome's mine power feeder cable...

Look at the special features available with Rome MPT—the easy-handling mine power feeder cable.

You get low initial cost, easy installation, and long life. And you naturally get important *safety* features: ground fault protection, a low-resistance circuit in case of shielding failure or ground faulting of equipment, and a flame-resistant jacket.

You can use Rome MPT in boreholes, shafts, trays, aerially, or underground. Sizes range from 6 AWG to 250,000 CM. A three-conductor cable, it's rated up to 5000 volts.

Specify Rome MPT for your next job. For further information, contact your nearest Rome Cable representative—or write to Department 751-B, Rome Cable Corporation, Rome, New York.

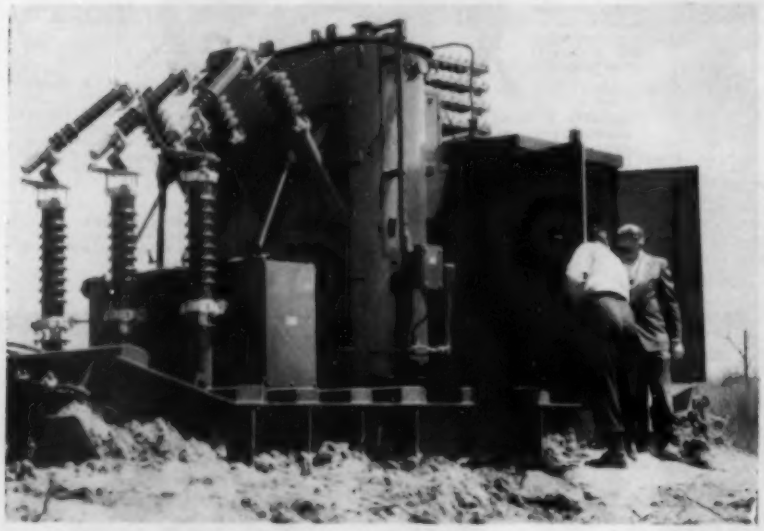
1. Costs less—up to 28%. Initial cost is lower than ordinary mine power feeder cables—as much as 28 per cent in the case of 2 AWG 3-conductor rubber and Neoprene sheathed cable 5 kv.

2. Cuts down installation time. Because it's smaller than others—and weighs less—Rome's mine power feeder cable is easier to install. Over-all weight is down as much as one-third. You can cut handling costs, use smaller fittings.

3. Lasts longer. You get a cable with one of Rome's *best* insulations and jackets. This means extra service life is built into the cable. Tough RoLene (polyethylene) insulation and a special flame-resistant RoSeal (polyethylene) jacket combine to give you outstanding resistance to chemicals, moisture, and abrasion.

ROME CABLE
CORPORATION

Operating Ideas

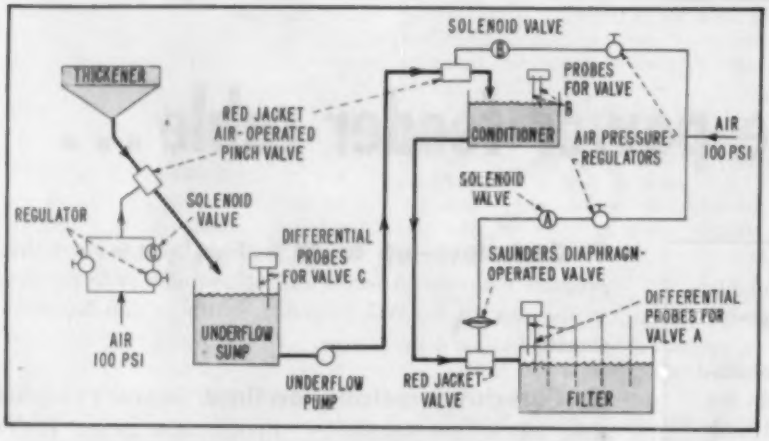


Mobile Substation For Rugged Terrain

FAST MOVES over rough ground in stripping areas are possible with this specially designed sled-mounted substation. Built with a low center of gravity and a 24-in clearance, the General Electric unit can be towed on slopes up to 30 deg.

Total weight of the unit is 14½ tons and includes a 3,750-kva forced-oil-air-cooled transformer, lightning arresters and accessories. The sled is made of 24-in I beams which are heavily braced and angled up at both ends for pulling by tractors.

The substation is being used at Peabody Coal's River Queen mine to supply power for a Bucyrus-Erie 55-cu yd electric shovel. Energy is transmitted to the substation at 34,500 v and reduced to 4,160 for operation of the shovel.



Automatic Feed-Flow Control Improves Filter Performance

SMOOTH OPERATION while running at full capacity results from application of automatic controls to all components of the filtering circuit at Clinchfield Coal's Compass No. 2 cleaning plant. From the time the underflow leaves the Dorr thickener until it reaches the Eimco filter, quantities are controlled automatically to permit each part of the circuit to operate at full capacity.

As a result of the automatic setup, the company gets the following four benefits:

1. A full filter cake at all times.

2. No recirculation of solids.

3. Permits the filter operator to be free nearly 90% of the time for performance of other duties.

4. Uniform moisture on the filter cake.

Before the automatic controls were installed, there were irregular levels in the sump conditioner and filter tub. As a result, it appeared that the filter and the thickener were not capable of handling all the material. And it took all the time of one man and part time work of another to keep the system going efficiently at Compass No. 2.

Here is how the automatic system works. Components of the control system are shown in an accompanying sketch.

Underflow from the thickener passes through a Red Jacket air-operated pinch valve before it passes to an underflow sump. This air-operated valve is controlled by high and low steps of pressure. The low-pressure side limits the flow to too small a volume. As a result, there is a "hunting" level which is determined by the positions of the two probes in the sump.

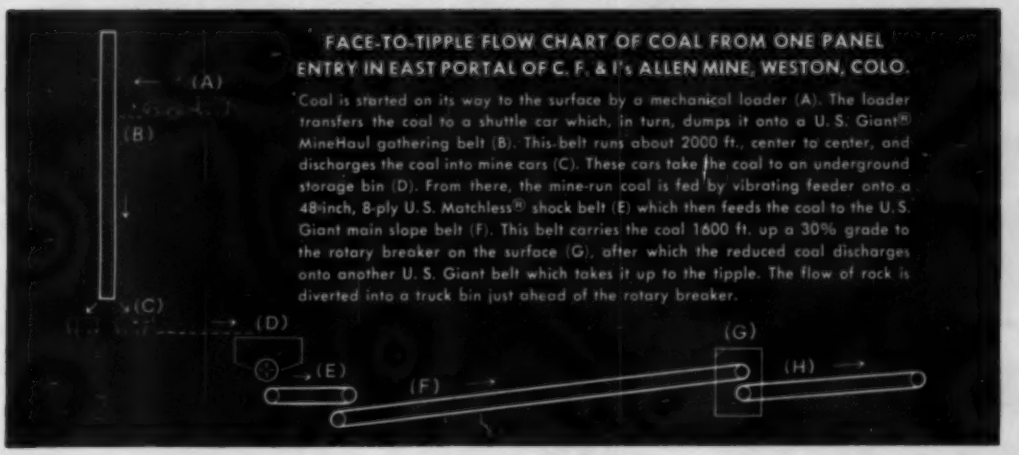
The speed of the centrifugal underflow pump in the sump is adjusted at a rate demanded by the Denver conditioner. Discharge to the conditioner is maintained at a rate below its capacity. This causes alternate restricted and unrestricted discharge from the pump. Probes at two different levels start and stop the pump.

Underflow from the conditioner to the Eimco filter tub passes through a Saunders air-operated diaphram valve. This is a straight on-off unit also controlled by two probes. The difference in level of the two probes is only 1 in and therefore the off time is not enough to permit settling.

Indicator lights on the plant control board flash on and off as the levels of the thickener-underflow and conditioner sumps rise and fall. Thus the operator can tell if the system is operating properly.

US RUBBER CONVEYOR BELTS

NO TRAFFIC JAMS ON THIS UNDERGROUND HIGHWAY SYSTEM

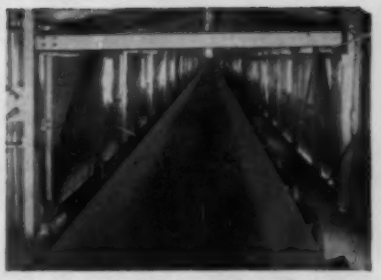


FACE-TO-TIPPLE FLOW CHART OF COAL FROM ONE PANEL ENTRY IN EAST PORTAL OF C. F. & I's ALLEN MINE, WESTON, COLO.

Coal is started on its way to the surface by a mechanical loader (A). The loader transfers the coal to a shuttle car which, in turn, dumps it onto a U. S. Giant® MineHaul gathering belt (B). This belt runs about 2000 ft., center to center, and discharges the coal into mine cars (C). These cars take the coal to an underground storage bin (D). From there, the mine-run coal is fed by vibrating feeder onto a 48-inch, 8-ply U. S. Matchless® shock belt (E) which then feeds the coal to the U. S. Giant main slope belt (F). This belt carries the coal 1600 ft. up a 30% grade to the rotary breaker on the surface (G), after which the reduced coal discharges onto another U. S. Giant belt which takes it up to the tipple. The flow of rock is diverted into a truck bin just ahead of the rotary breaker.

30-inch, 4-ply, style XN, U. S. Giant Mine-Haul gathering belt receiving mine-run coal from shuttle car. Note use of U. S. Royalite® Skirtboard rubber to facilitate loading.

48-inch, 8-ply, U. S. Matchless Ustex®-Nylon main slope conveyor belt. It has already carried millions of tons of mine-run coal. Note the extreme conditions of cold and moisture.



This 320-ft. c-c belt is a 48-inch, 5-ply U. S. Giant. It carries minus one and one-half inch broken coal up a 9% grade from the rotary breaker to the railroad loading tipple.

The Allen Mine of The Colorado Fuel and Iron Corporation is one of the safest and most modern coal mines in the West. It is another fine example of engineering skills combining with U. S. Rubber belting to produce a maximum in efficient operation.

The mine was opened about five years ago and U. S. Rubber Conveyor Belts have been used almost exclusively in just about every phase of the face-to-tipple operation.

There has never been a belt failure and Mine Superintendent L. W. Ingles has expressed complete satisfaction with the belts.

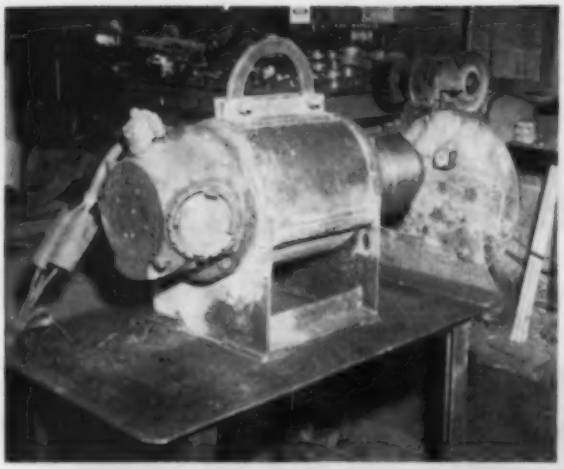
For greater output at lower cost per ton, ask for U. S. Rubber's Three-Way Engineering. This service, plus a complete line of conveyor belting for any mining requirement, is available at the 28 "U. S." District Sales Offices or by writing us at Rockefeller Center, New York 20, N. Y.

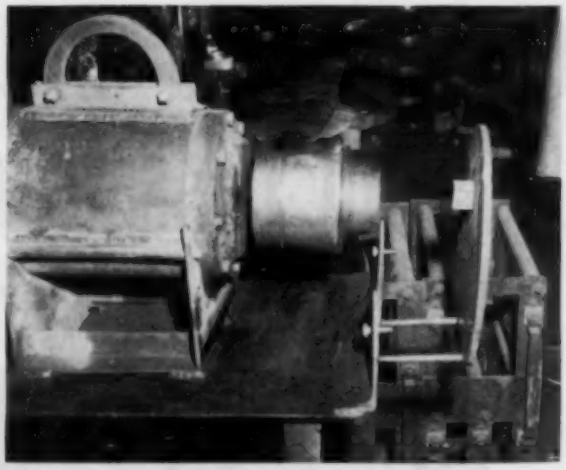
In Canada, Dominion Rubber Co., Ltd.

US RUBBER **Mechanical Goods Division**

United States Rubber

See things you never saw before. Visit U. S. Rubber's new Exhibit Hall, Rockefeller Center, N.Y.





Testing Device Handles Three Maintenance Jobs

A TESTING DEVICE which presets 12 BU Joy loader gathering head liquid clutches, load tests 9J motors and tests head and traction speed reducers has been developed by Wayne Myers, electrical engineer for Guyan Eagle Coal Co., Amherstdale, W. Va.

The unit consists of a 9J motor and speed reducer mounted on a bedplate. A clutch adapter plate with a square stud welded in the center is used to lock the clutch. The plate also has two holes at the bottom 10 in apart so it can be bolted in place after the clutch is placed on the reducer shaft. A hook-on-type ammeter is used to set the clutches at the desired rating.

The clutches are dismantled, worn parts are replaced and the clutches are reassembled. After reassembling, oil is added and the clutches are then placed in the tester. The clutch adjustment and locking screws are left loose. The motor on the tester is started and the adjustment is made by reading the ammeter and tightening the adjusting nut until the clutch slips at the desired load as shown by the ammeter reading.

Clutches are set to slip at a motor load of 36 amps at a line voltage of 290 v, which is equivalent to 45 amps at 230 v. This allows for varying voltage at the face. After the clutches have been set the locking screws are tightened and spot welded so that the rating cannot be increased in the mine.

Prior to the development of the tester the company sent the clutches to the Penn Machine Co., Johnstown, Pa., manufacturer of the liquid clutch, to be rebuilt and preset. The time involved in transit and the express charges which increased the cost of rebuilding have been eliminated.

Load testing 9J motors is accomplished by adjusting a clutch to the load at which the motor is to be tested. The ammeter also is used to determine the percent overload applied to the motor.

Load tests conducted on each motor rebuilt at the shop will show faults resulting from material used or in reassembling. These faults can be corrected before the motors are placed in service.

A speed reducer can be checked by the test unit simply by installing it in the reducer housing and allowing it to run for a period of time. An ammeter will detect mechanical overload. Signs of heating will indicate faulty bearings, gears or improper assembling.

Simplicity of the tester and its ability to test three units, i. e., clutches, motors and speed reducers, result in higher quality rebuilt equipment. Guyan Eagle credits reduced maintenance cost and production down time to load-testing equipment before it is installed on machines inside the mine.

Stainless Steel Covers Plant

THE FIRST coal preparation plant to be built with stainless steel sheathing will begin operations this fall at the new River King mine near Freeburg, Ill. Peabody Coal Co., owners of the new 8,000-ton mine, chose stainless steel for the plant exterior because it requires little maintenance and is resistant to corrosion. Since the mine is expected to be in operation for many years, the company expects considerable savings from the elimination of painting. And the buildings will appear bright at all times.

Each stainless steel panel was 34 in wide, providing a 32-in coverage, and 0.019 in thick. Lengths varied from 5 to 12 ft per panel. The cornice and flashing used was smooth-finished stainless steel. Conveyors and the smoke stack also will be sheathed with stainless steel. Inside the plant, extensive use of stainless steel was made in dryer fan blades, dryer screens, sluices, conveyor bottoms and other parts calling for good wear and corrosion resistance.

United States Steel Corp. supplied the stainless steel panels used. Major stainless steel producers make extensive use of alloys produced by Electric Metallurgical Co., Div. of Union Carbide Corp.

The Peabody plant was designed by the McNally Pittsburg Mfg. Corp., Pittsburg, Kansas, and erected by Silas Campbell Construction, Harlan, Ky.

HERE ARE JUST A FEW OF THE ARTICLES YOU MISSED

if you didn't get haulage ways last year!

(A REPRESENTATIVE SELECTION FROM SIX MONTHLY ISSUES)

Editor
O-B Haulage Ways
Ohio Brass Co.
Mansfield, Ohio

Haulage Ways is an 8-page monthly bulletin published by the Ohio Brass Co. and sent free of charge to 8,000 mining men in the U.S. and abroad.

Dear Ed:

I DON'T WANT TO MISS ANY MORE — SIGN ME UP RIGHT NOW!

NAME _____

POSITION _____

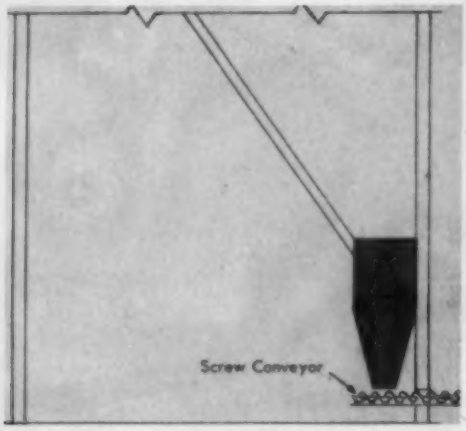
COMPANY _____

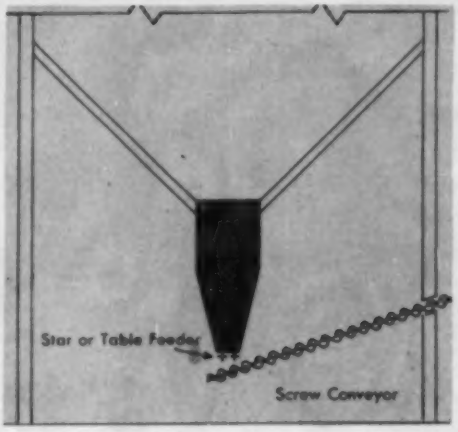
ADDRESS _____

CITY & STATE _____

4810-M

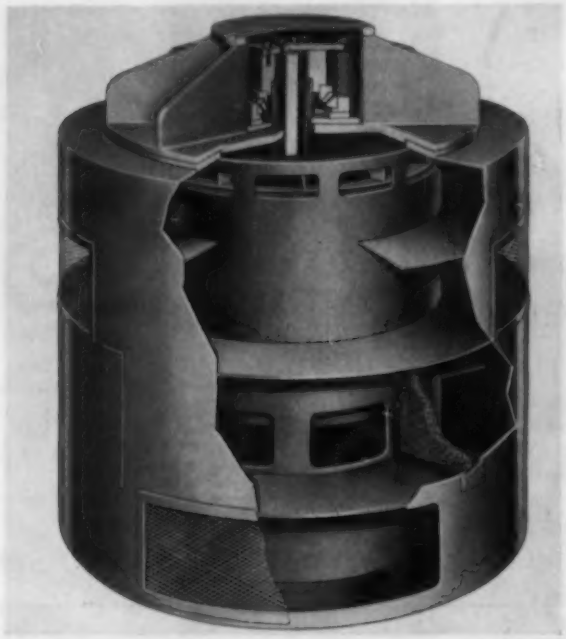
Equipment News





BCR Bin Discharge Unit Handles Wet Fine Coal

New bin-discharge device (patent pending), a development of Bituminous Coal Research, Inc., 121 Meyran Ave. at Forbes St., Pittsburgh 13, Pa., handles ¼xO coal with up to 15% surface moisture, provides reliable flow with coal sizes up to 3 in, permits gravity feed rates of up to 3½ tpm, and is usable with other bulk solids including sand. The "BCR Easy-Flo" also is said to eliminate flow stoppages, and contains no moving parts or vibrators. Low-pressure operation eliminates the need for expensive cut-off gates. The device, when added as a permanent part of a conventional bin, provides a means for controlling the flow of coal through a 3-ft opening in the bottom of the storage bin. Once the stored material passes by gravity from the bin into the discharge device, the double-cone arrangement maintains the material in an unpacked state. Gravity outflow through the 12-in discharge opening of the device is assured because the forces acting on the material are controlled and conditions which are the causes of stoppages in conventional bins cannot develop. The setups in the accompanying illustration are typical applications for cylindrical bins. Suggested applications for other forms of bins will be supplied upon request to BCR. BCR has completed pilot-plant tests and is now building a full-scale, commercial-type bin at its Columbus laboratory.



Weathertight Vertical Motors

Vertical weather-protected motors with enclosures built to NEMA Type II standard are now available from Allis-Chalmers Mfg. Co., Milwaukee 1, Wis., in squirrel-cage and wound-rotor induction and synchronous types in ratings of 250 hp and up. Designed for outdoor applications on pumps and other vertical drives, ventilating passages of the new motors are constructed to minimize the entrance of rain, snow and airborne particles. Air entering the machines is circulated and discharged without entering the internal vent passages leading to electric parts. Wire-mesh filters and space heaters are optional. A further measure of protection is available for large A-C motors in "Silco-Flex" silicone-rubber stator coil insulation.

New Truck Models

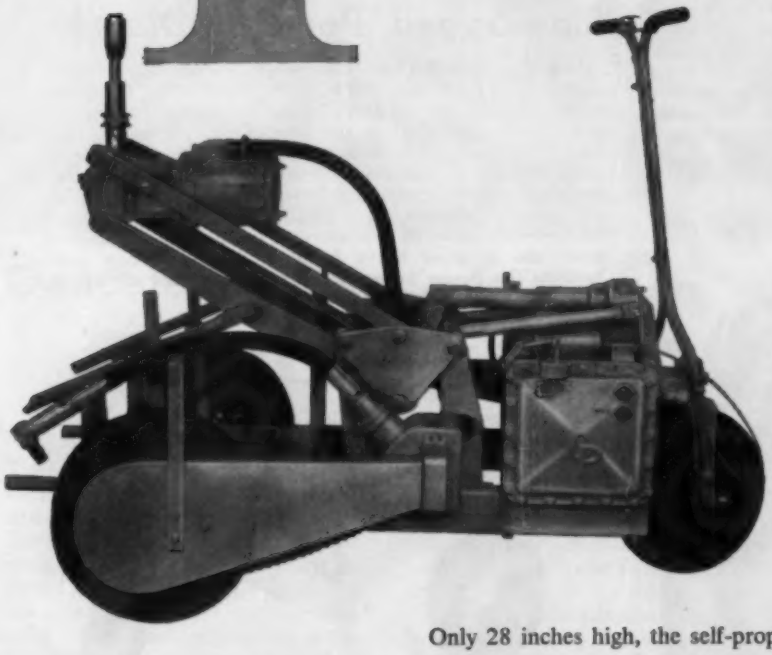
Chevrolet's new 1958 line of trucks offers three weight classifications as follows: Apache, for light duty with gross-vehicle-weight ratings up to 9,600 lb and available on six different wheelbases; Viking, for medium duty with gvw

IN 3 MINUTES THE CP ROOF BOLTING UNIT...

1 • trams into a seam under its own power

2 • sets expansion bolt without repositioning

3 • drills hole at 4 feet per minute



These EXTRAS are available:

- Special low-speed spindle attachment for slow-speed drilling
- Low-seam drilling attachment for low-coal

Only 28 inches high, the self-propelled RBD-30-S is ideal for use in low coal, takes high seams in its stride – even drills slate, shale and laminated limestone without delays. A power take-off from auger and bolt-setter motor powers a totally enclosed drive gear. Tramming control is within easy reach between guide arm handles. Telescopic chuck has a 6-inch auger adjustment to conform to roof irregularities. Built-in slip clutches prevent stalling . . . wheel locks prevent unit from shifting position.

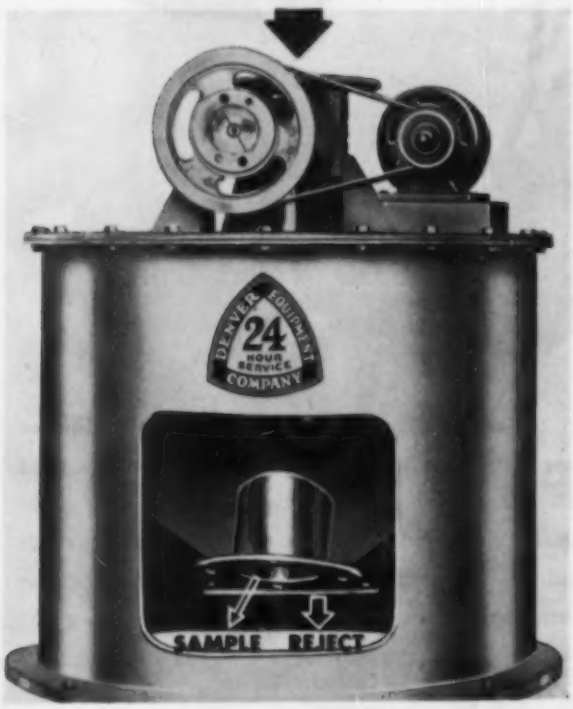
Chicago Pneumatic *8 East 44th Street, New York 17, N. Y.*

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

ratings up to 21,000 lb on 12 different wheelbases; and Spartan, for heavy duty in gvw ratings up to 25,000 lb on nine different wheelbases. A new 348-cu in V8 engine has been designed for use in the larger trucks as standard equipment. Bore and stroke are 4.125 in and 3.25 in, respectively, and compression ratio is 8:1. The engine is rated at 230 hp, featuring compactness in design; stellite-faced, sodium-cooled exhaust valves which seat on replaceable silichrome inserts, and new configuration of exhaust manifold for more efficient scavenging.

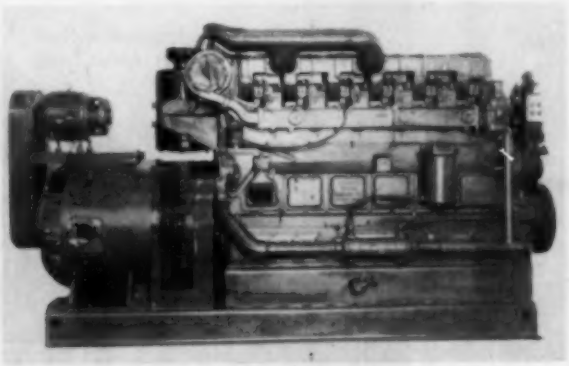
Torque-Converter Tractor

LeTourneau-Westinghouse Type B Tournapulls now offer choice of transmissions—torque converter or manual shift. New torque-converter version can be had with any of standard trailing tools, including scraper, rear dump or 30-ton mobile crane. The new Tournapull is equipped with a 335-hp turbocharged diesel engine. The torque converter, built by Allison Div., General Motors Corp., consists of single-stage, four-element converter combined with a heavy-duty gearbox. Automatic lock-up clutch eliminates power-consuming slippage at haul speeds, putting tractor into direct drive and locking out torque converter. Hydraulic retarder automatically provides counter-pressure on converter elements when unit descends in forward ranges.



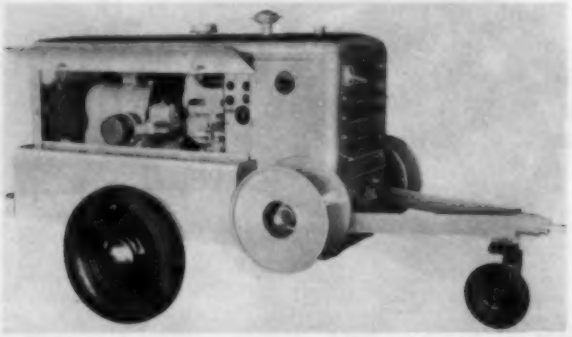
Compact Full-Stream Sampler

Denver Vezin-type sampler, designed to take all of the stream part of the time, is contained in a compact, cylindrical housing. One or more radial cutters are attached to a revolving vertical cylinder and shaft inside a dust-tight sheet-metal housing. Cutters revolve at the correct speed to allow sample to properly enter cutter without interference. Sample is fed to following equipment for further reduction or treatment and reject is returned to circuit. Maximum particle size for 20-in sampler is ¾ in, and for 60-in sampler, 2 in. The sampler is fabricated from heavy steel plate with a design that protects the mechanism from dust created by the stream. The unit, of acid-proof construction, if desired, also is available in 24-, 28-, 36-, and 48-in sizes. Full details from Denver Equipment Co., P. O. Box 5268, Denver 17, Colo.



Slow-Speed, Powerful Diesel

New Cummins LRT-6 "Turbodiesel" engine has a rating of 450 hp at 1,100 rpm. Total displacement in the 6-cylinder engine is 2,477 cu in. Designed for applications calling for slow speed with high horespower and torque ratings, the LRT-6 is equipped with a Cummins T-590 turbocharger and Cummins PT (pressure-time) fuel system, in which fuel metering utilizes a fixed size opening in a simple injector and variable pressure to meter the fuel charge. Intended for use with industrial generators, in locomotives, in pumping units and in other heavy industrial work, the new units broaden the power range of the L-type engines offered by Cummins Engine Co., Inc., Columbus, Ind.



Compressor With Few Working Parts

Davey Compressor Co., Kent, Ohio, announces the new 125-cfm "Hydrvane" compressor, which the company says has greater efficiency with less than half the working parts. The unit is a multi-stage rotary compressor with a single free-floating rotor, which is so located that it is constantly concentric with one side only of the stator. Cooling oil is injected during compression to lower the discharge temperature as much as 100 deg below that of other units. All parts are readily removable through end and side panels and no special tools are required for servicing, the manufacturer says.

(*Continued on p 116*)

Delicate appetite for a "Queen"...

80 TONS IN ONE BITE!

But look at the size of her! Taller than a 13-story building, and weighing 2,400 tons, this lady is entitled to a queen-size appetite. She's the *River Queen*—largest power shovel ever built by the Bucyrus-Erie Company. And her huge, 80-ton-capacity bucket is made of tough USS "T-1" Steel to keep her eating regularly for a long time. Backed by 15 powerful motors and fronted by a formidable row of ripping teeth, the "Queen's" huge maw scoops up 55 cu. yds. of overburden at a gulp and dumps it nearly 300 feet away from the digging point. Digging and dumping in less than a minute, the *River Queen* could pile up a mountain of more than 100,000 tons of overburden in 24 hours!

This big shovel is being used to uncover two seams of coal for W. G. Duncan & Peabody Coal Companies in western Kentucky. When the mine is in full operation, its output is expected to be 2 million tons of coal annually. The "Queen" will be highly instrumental in making this possible.

With all the weight and mechanical muscle the big shovel possesses, her dipper has to be a real battering ram. That's why it's made of USS "T-1" constructional alloy steel. Biting and ramming through rock and earth, hour after hour, day after day, is punishing service. USS "T-1" Steel is designed to take this kind of impact, shock and abrasion. And its amazing toughness never faiters, even at temperatures far below zero.

The very high yield strength of USS "T-1" Steel—90,000 psi minimum—saved tons of weight in the big dipper, making a bigger payload possible with each scoop. And, speaking of strength, the 86-foot dipper handle and the 145-foot boom are made of another U. S. Steel product, USS TRI-TEN high-strength low-alloy steel.

• • •

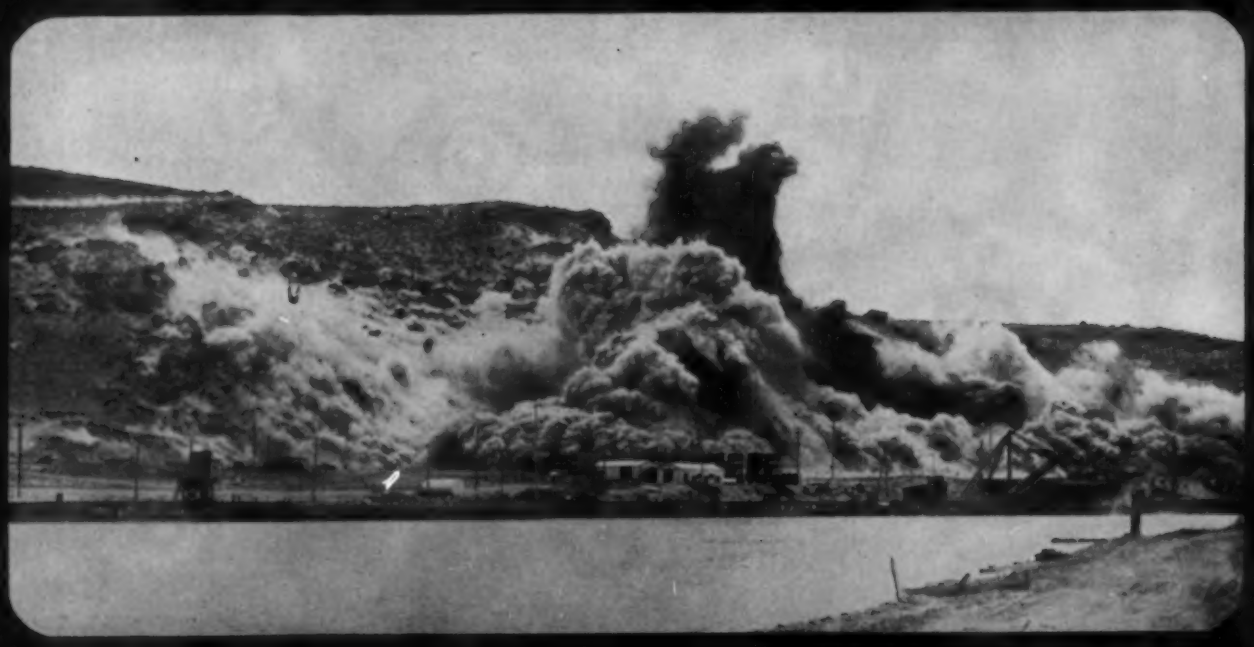
Perhaps you need a steel that offers high strength, extraordinary toughness, resistance to impact abrasion, or good creep rupture strength combined with ease of fabrication. USS "T-1" Steel is your answer, and we'll gladly help you adapt it to your particular application. United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

United States Steel Corporation, Pittsburgh · Columbia-Geneva Steel Division, San Francisco
Tennessee Coal & Iron Division, Fairfield, Ala.
United States Steel Supply Division, Warehouse Distributors, Coast-To-Coast
United States Steel Export Company, New York

USS "T-1" CONSTRUCTIONAL ALLOY STEEL

USS, "T-1," and TRI-TEN are registered trademarks.

USS UNITED STATES STEEL



1 1,790,000 lb. charge of Amocol ammonium nitrate blasting agent primed with 60% Extra dynamite erupts with controlled violence to break and displace over 2,500,000 cubic yards of quartzite, the largest industrial blast in the nation's history.

Making mincemeat out of a mountainside . . .

THIS BLAST BROKE ALL RECORDS!

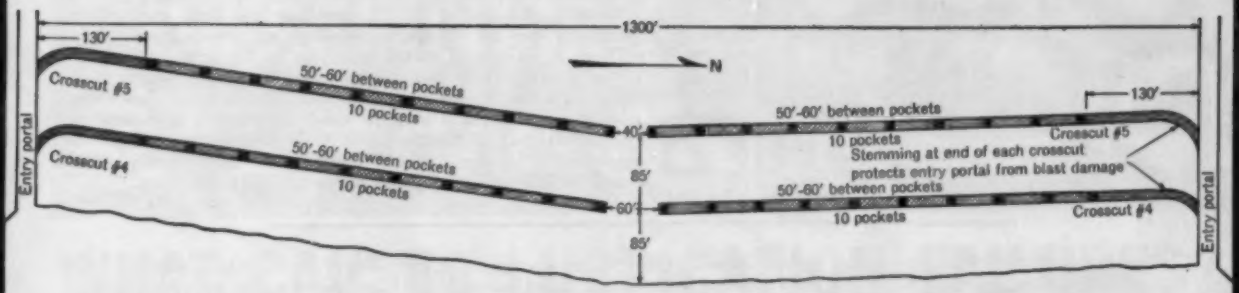
Two-and-a-half million cubic yards of rock broken by one construction blast! That's the record-smashing result achieved this summer at Little Valley, Utah, in the world's largest non-atomic blast.

Morrison-Knudsen Company, Inc., scored this industrial record with 1,790,000 lbs. of Atlas Amocol blasting agent and Atlas 60% Extra dynamite, detonated in two 1,300-foot coyote crosscuts driven from permanent entry portals (see sketch).

M-K engineers directing this project estimated that the blast produced over a tenth of the rock needed for the 13-mile causeway being built for the Southern Pacific railroad across the Great Salt Lake at Promontory Point.

Atlas is proud of the part its products and technical assistance played in making this historic blast a success.

EXPLOSIVES DIVISION
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE
offices in principal cities



Plan of portals and crosscuts 5′ x 7′

Height of burden from floor of crosscuts 200′

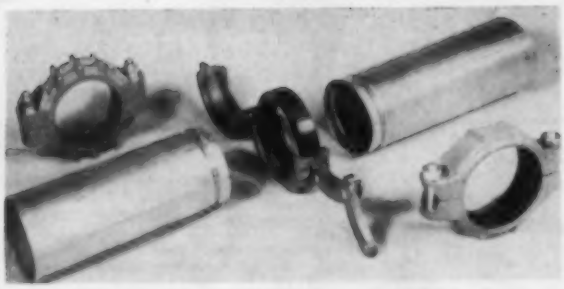
■ Explosives pocket

▒ Sand stemming

Amount of explosives used:	
Atlas Amocol	1,432,000 lb.
Atlas 60% Extra dynamite	358,000 lb.
Total	1,790,000 lb.
Amount of rock produced	2,500,000 cu. yd.

2 The two 1,300-foot coyote crosscuts were fired 25 milliseconds apart with Rockmaster electric blasting caps attached to the detonating fuse connecting individual charges within each tunnel. The crosscut nearest the face was fired first to provide relief for the second.

3 Muckpile shows uniform breakage and excellent displacement. Nearby buildings and equipment are untouched by throw. Only blast damage was to adjacent power and telephone lines which were purposely allowed to remain in shot area to minimize replacement costs. The rock will provide solid fill for causeway and also will be used as riprap in final stage of construction.



Quick Joints in Light Tube

"Vic-Easy", a new method of joining thin-wall steel and aluminum pipe and tubing developed by Victaulic Co. of America, Elizabeth, N. J., provides leak-tight connections through the use of quick couplings on grooved pipe ends. There is no loss of metal in rolling in the grooves and the pipe is structurally sound after grooving, the company says. The "Vic-Easy" method is available for tubing in sizes from 1¼ in to 12 in, and may be used for working pressures up to 1,000 psi, depending upon wall thickness and type of coupling. Savings include lower labor costs, lower inital cost of thin-wall tubing and lower transportation costs.

Shaft-Mounted Drive

Falk Corp., West Canal St., Milwaukee 1, Wis., announces a higher-capacity shaft-mounted drive, the 315J, available in single reduction ratio of 5:1 and in two double-reduction ratios of 14:1 and 25:1. Ratings range from 2 hp at 5 rpm to 50 hp at 359 rpm, with maximum torque rating at low shaft speed of 31,000 lb-in. Longer center distance between shafts permits use of larger sheaves in installations where unit is mounted with input shaft toward driven machine. Inspection covers provide easy access to bearings and helical gears, and an automotive-type dip stick is provided for checking oil level. Full details in Bulletin 7100, available from Falk Corp.

Safer Stud Driving

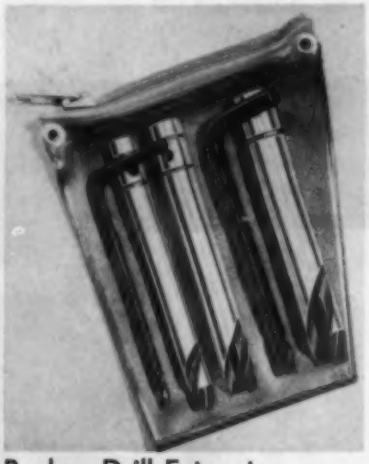
A new emergency arresting device in the Remington 455A stud driver stops an alloy steel fastener in its tracks if it should be mistakenly fired into a soft or insubstantial construction material. The guard assembly, featuring the captive-stud idea for use where special safety precautions are called for, halts the driving piston and stud at the muzzle of the stud driver if the material to be penetrated by the stud lacks the necessary backing. The stud is threaded to the piston and the piston is arrested by an aluminum buffer in the guard assembly. In normal use the piston and buffer do not engage and there is no undue wear on either. However, if the tool is applied to a penetrable work surface, the buffer arrests the piston, restraining the stud from complete penetration or free flight. The buffer is replaceable since it is deformed in arresting the powder-actuated piston. Full details from Remington Arms Co., Inc., Bridgeport, Conn.

Storage Pile Protection

"Permaspray", a new development of Johnson-March Corp., Philadelphia 3, Pa., is a colloidal suspension in water of a special chemical which forms a tough, flexible, water-resistant film when exposed to air and hardened. It is suitable for coating stockpiles of coal, coke breeze, flyash and other materials in storage regardless of composition or particle size. The deposited film is said to resist the action of wind, rain, frost or heat, prevents windage losses and prevents dust. Permaspray is nontoxic, non-corrosive and without adverse effect on the burning qualities of coal. The product, which has the consistency of water, can be easily handled in any spraying equipment. Supplied in 55-gal drums (1 gal per 100 sq ft), Permaspray costs 65c per gal, f. o. b. Philadelphia.

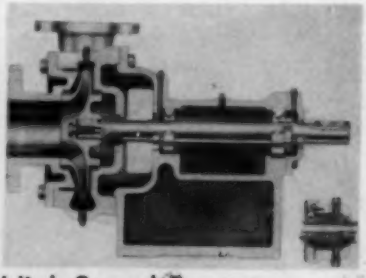
Cold Vulcanizing Paste

"Ka-Vu" no-patch cold vulcanizing paste repairs rubber items from boots to conveyor belts. The compound will not dissolve in water and provides the heat-and acid-resistance of rubber. No patches are needed, according to Richard J. Kern, 2160 Newbold Ave., New York 62, N. Y., the U. S. importer of this Swiss Development.



Broken Drill Extractor

A new twist-drill extractor is offered by Eagle Metal & Tool Corp., 150 Broadway, New York 38, N. Y., which requires only normal hand pressure in operation and which may be used without disturbing set-up of the work. The standard set consists of five extractors, 5/32 to 1 in, and special sizes are available.



High-Speed Pumps

A new line of high-speed, high-head centriugal pumps for general water service is announced by Gardner-Denver Co., Quincy, Ill., featuring stainless-steel shafts, oil-lubricated heavy-duty ball bearings, mechanical seals, accurately-contoured casings and hy-

COAL MINING

DIESEL LUBRICATION GUIDE

CITIES SERVICE

WHAT CAUSES LUBRICATION FAILURES?

The biggest single reason for lubrication failure is improper selection and application of lubricants.

Today's lubricating oils are made for highly specialized purposes. The fact that an oil seems ideal for the requirements of one piece of equipment is no guarantee of its qualifications for other machinery.

For example, choice of an oil with low detergency may result in stuck rings, excess cylinder wear, injector clogging, bearing wear and other diesel difficulties.

Next time you're considering what type of oil to use for a certain piece of equipment, call in a Cities Service Lubrication Engineer. He not only has the precise oil for the particular unit you want to lubricate, but may be able to simplify your entire lubrication picture and reduce maintenance costs as well.

USERS ACCLAIM CITIES SERVICE C-300 OIL

From a strip miner comes this report: "Shovel and dragline work 20 hrs. a day, seven days a week. Each have rolled up over 14,000 hrs. with no major overhaul, using Cities Service C-300 Motor Oil."

From a leading stone company: "Our six stationary diesels, powering our compressors and crushers, have averaged 12,000 hours each before major overhaul, with Cities Service C-300 Oil."

From a trucking company: "Our 20 diesels get up to 225,000 miles before overhaul with Cities Service C-300 Oil. We don't even grind the valves before then."

With excellent oxidation resistance, high detergency, and low carbon residue, Cities Service C-300 Oil may be the perfect lubricant for your machinery, too.

Get the facts from a Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

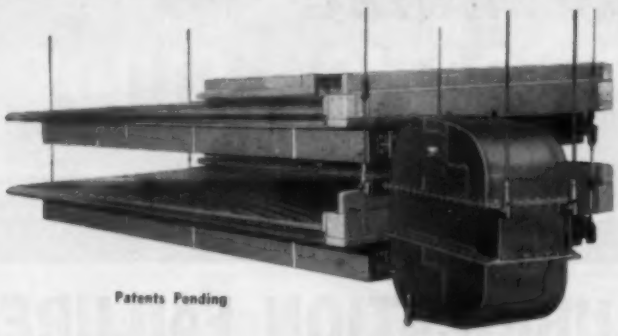
USING A SULPHUROUS FUEL? TRY THIS NEW CITIES SERVICE OIL

If you're using a diesel fuel with high sulphur content, your motor oil must do more than its normal share of work to fight engine deposits.

Cities Service C-100 Motor Oil has been formulated for just this purpose. Under dusty, dirty, and sulphurous conditions, it provides excellent engine lubrication and protection. Talk with your Cities Service Lubrication Engineer for details.

MAN YOU SHOULD KNOW

Barney Fleming is the Regional Manager of Industrial Oil Sales at the Cities Service office in St. Paul, Minnesota. With a background of 35 years as a lubrication engineer and a talent for solving problems, he is typical of the Cities Service engineering staff that's at your service. A call to the nearest Cities Service office will bring a member of this staff to your plant or job site.



Patents Pending

Twin Decks of the CONCENCO "77" Table Double Coal Washing Capacity

The CONCENCO® "77" DIAGONAL-DECK® Table prepares twice as much coal per unit of machine or floor space as was formerly possible with the finest single deck table.

The "77" table, equipped with two identical decks in floating suspension, not only offers the quietest-smoothest operation ever achieved on a washing table, but eliminates the need for massive concrete table foundations. Impact to building structure is practically eliminated, permitting lighter steel construction in new plants at substantial savings in cost. In old table plants this same feature makes possible the doubling of washing capacity over any or all of the floor area . . . without adding to, revamping, or reinforcing their steel framing structures.

With all these advantages, the high efficiency of the famous DIAGONAL-DECK table is positively maintained. Integrated head motion operating both decks simultaneously requires less than 3 H. P.

For full information, send for Bulletin 77.

CONCENCO®
Feed Distributor

While unexcelled for feeding coal washing tables, the CONCENCO Revolving Feed Distributor effectively provides a splitting of feed into any desired number of equal portions, to accurately feed circuits or machines in battery for their greater overall efficiency. It is a heavily fabricated all steel machine with motor drive requiring 1 H. P. or less in operation.

THE DEISTER ★
CONCENTRATOR
COMPANY
913 Glasgow Ave. • Fort Wayne, Ind., U.S.A.
CONCENCO PRODUCTS

★ *The ORIGINAL Deister Company • Inc. 1906*

Equipment News (*Continued*)

draulically balanced bronze impellers. New Model BH pumps are available in four sizes: 1-in with model capacities up to 150 gpm; 1½-in with capacities up to 220 gpm; 2-in to 440 gpm and 3-in to 520 gpm.

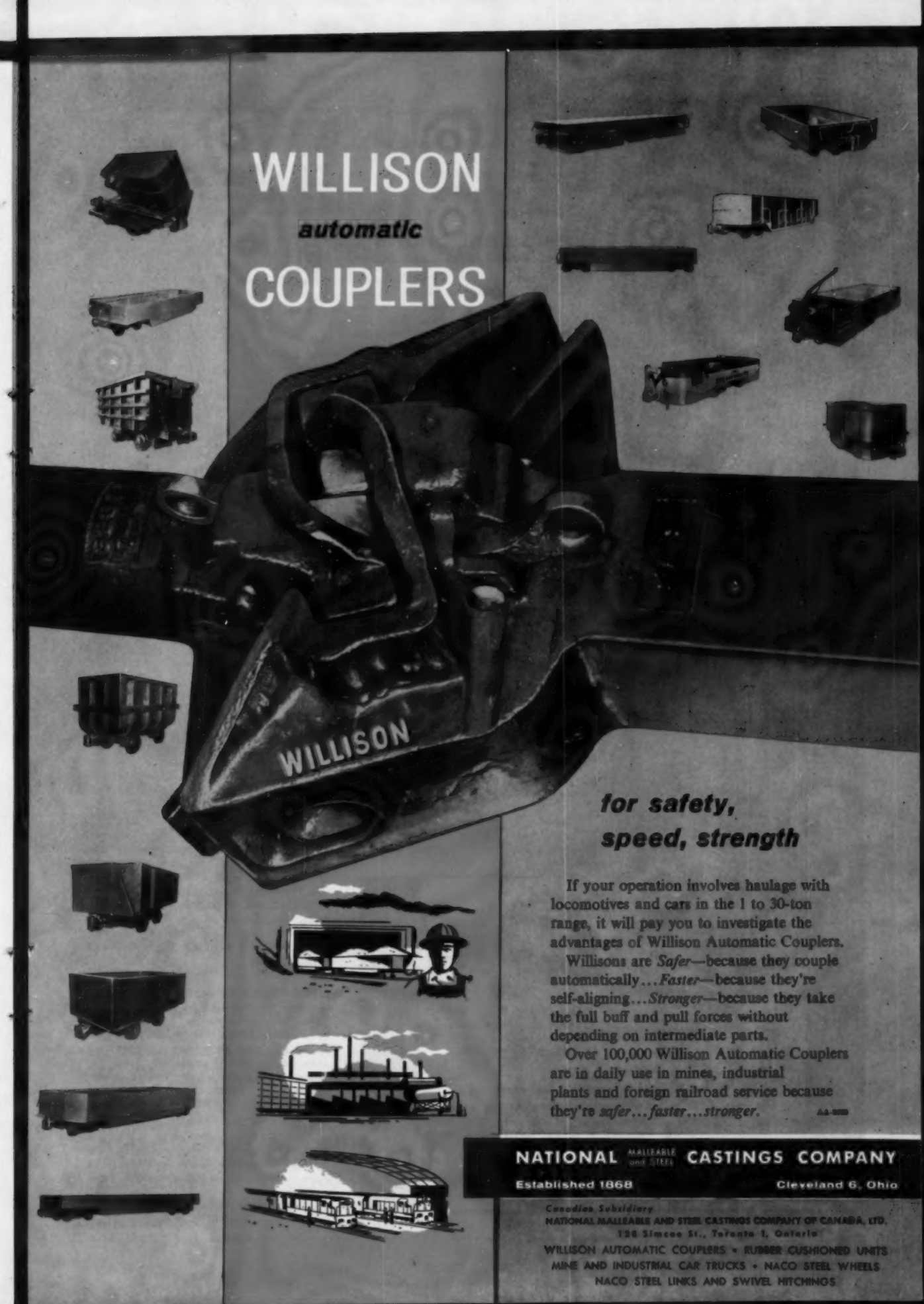
Plastic-Leather Belting

Power-transmission belting, "Extremultus", a combination of a special polymer and chrome-tanned leather, will not slip or stretch, will operate at ratios up to 20:1 and arcs of contact as low as 90 deg and will operate under shock loads up to seven times the normal running loads. The polymer provides the tensile strength and the chrome leather provides the friction surface. The belt has been used on the Continent for 15 yr and was introduced to the American market about 18 mo ago. More information from Extremultus, Inc., 405 Lexington Ave., New York 17, N. Y.

Submersible Pump

A new pump, the Sumo electric submersible, is said to function effectively in heavy-duty pumping of water containing up to 20% solids. The pump is adaptable to filter-screen sump service, dewatering of mines and removing muck from excavations. The unit operates either partly or fully submerged, and features a built-in thermostatic cut-off to protect the motor from against damage from overheating, overloading or obstructions. An automatic reset starts the pump when the cause of the stoppage has been removed. The 7½-hp motor operates in a factory-sealed oil bath and is cooled by discharge water. The pump has a capacity of 460 gpm at 15-ft head and 145

WILLISON
automatic
COUPLERS



for safety, speed, strength

If your operation involves haulage with locomotives and cars in the 1 to 30-ton range, it will pay you to investigate the advantages of Willison Automatic Couplers.

Willisons are *Safer*—because they couple automatically...*Faster*—because they're self-aligning...*Stronger*—because they take the full buff and pull forces without depending on intermediate parts.

Over 100,000 Willison Automatic Couplers are in daily use in mines, industrial plants and foreign railroad service because they're *safer...faster...stronger.* AA-5028

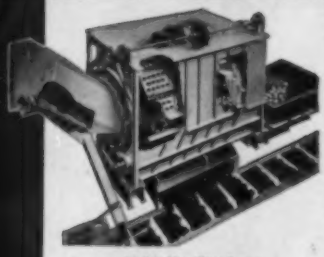
NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

Established 1868 — Cleveland 6, Ohio

Canadian Subsidiary
NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY OF CANADA, LTD.
126 Simcoe St., Toronto 1, Ontario

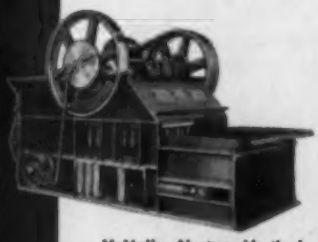
WILLISON AUTOMATIC COUPLERS • RUBBER CUSHIONED UNITS
MINE AND INDUSTRIAL CAR TRUCKS • NACO STEEL WHEELS
NACO STEEL LINKS AND SWIVEL HITCHINGS

America's most complete line of CRUSHING EQUIPMENT



McNally Pittsburg Rotary Breaker

This unit allows positive control of top size in handling run-of-mine washery feed. Production of fines is held to a minimum.



McNally Norton Vertical Pick Breaker

50% Less fines when reducing lump to egg and stove sizes.

McNally Double Roll Gearmatic ROM Breaker

Built in tonnage ranges from 750 tph to 1400 tph. Full floating gearmatic drive.

McNally Gearmatic Stoker Coal Crusher

This unit offers three prime advantages: high volume production, plus accurate sizing, plus low percentage of fines.

McNally Single Roll Crusher

Universal application 20", 24" and 36" diameter rolls.

AVAILABLE

From Stock and on Short Delivery

For immediate action on complete information write, wire, or call.

McNALLY PITTSBURG MFG. CORP.

Pittsburg, Kansas Wellston, Ohio

Equipment News (*Continued*)

gpm at 70 ft head. The complete unit weighs 238 lb, and is made by Sumo Pumps, Inc., Brown House Rd., Stamford, Conn.

Equipment Shorts

HOSE—Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber, Boston 3, Mass., is offering two new hose lines—industrial water hose and "performer" air-water hose. The industrial water hose is designed for economical discharge requirements and is made in a number of sizes. The air-water hose meets the need for water discharge where moderate pressures are required. Box 1071.

AEROSOL LUBRICATOR—Whitmore Mfg. Co. is distributing its liquid gear composition in 16-oz push-button aerosol containers. Named "Handi-Lube," the container and contents are designed for quick applications on open gears. Free samples of Whitmore's lubricant are available from the company at Cleveland 4, Ohio. Specify application when requesting samples.

SCRAPER—The "Lowbowl" scraper design is being made available for use with the Caterpillar D7 tractor by Caterpillar Tractor Co., which has announced the No. 435 "Lowbowl" scraper, a new, four-wheel unit which replaces the No. 70 in the company's line. Struck capacity is 13 yd, an increase of 27% over the No. 70.

DELUXE DRILL—Gardner-Denver Co., Quincy, Ill., is producing its "Air Trac" in a deluxe model equipped with complete power positioning of all vertical, horizontal and flat lifter holes. In addition, a new hydraulic drill positioner (Model DPAT) provides 120-deg mast swing and can be indexed for an additional 90 deg swing. All controls have been centralized.

INDUSTRIAL ENGINE—The Caterpillar D318 (Series G) engine is being made as the power unit for both turbocharged and naturally aspirated electric sets, according to Caterpillar Tractor Co., Peoria, Ill. Thus the new Cat D318 electric sets are a combination of the D318 and the company's self-regulated constant voltage Cat generator. The arrangement is rated at 75 kw (turbocharged) and 60 kw (natural aspirated).

SILICONE-INSULATED WIRE—General Electric's Wire & Cable Dept. has introduced Type RHH wires for general purpose wiring. Prior to this the wire, which is insulated with silicone rubber and an asbestos braid, had been available only for fixtures and appliances. The new wire is rated at 600 v, 90 C.

ANGULAR TORCH HEAD—New adapter, usable with all Airco cutting tips, adjusts 90 deg either side of vertical, according to Air Reduction Sales Co., 150 East 42nd St., New York 17, N. Y.

Free Bulletins

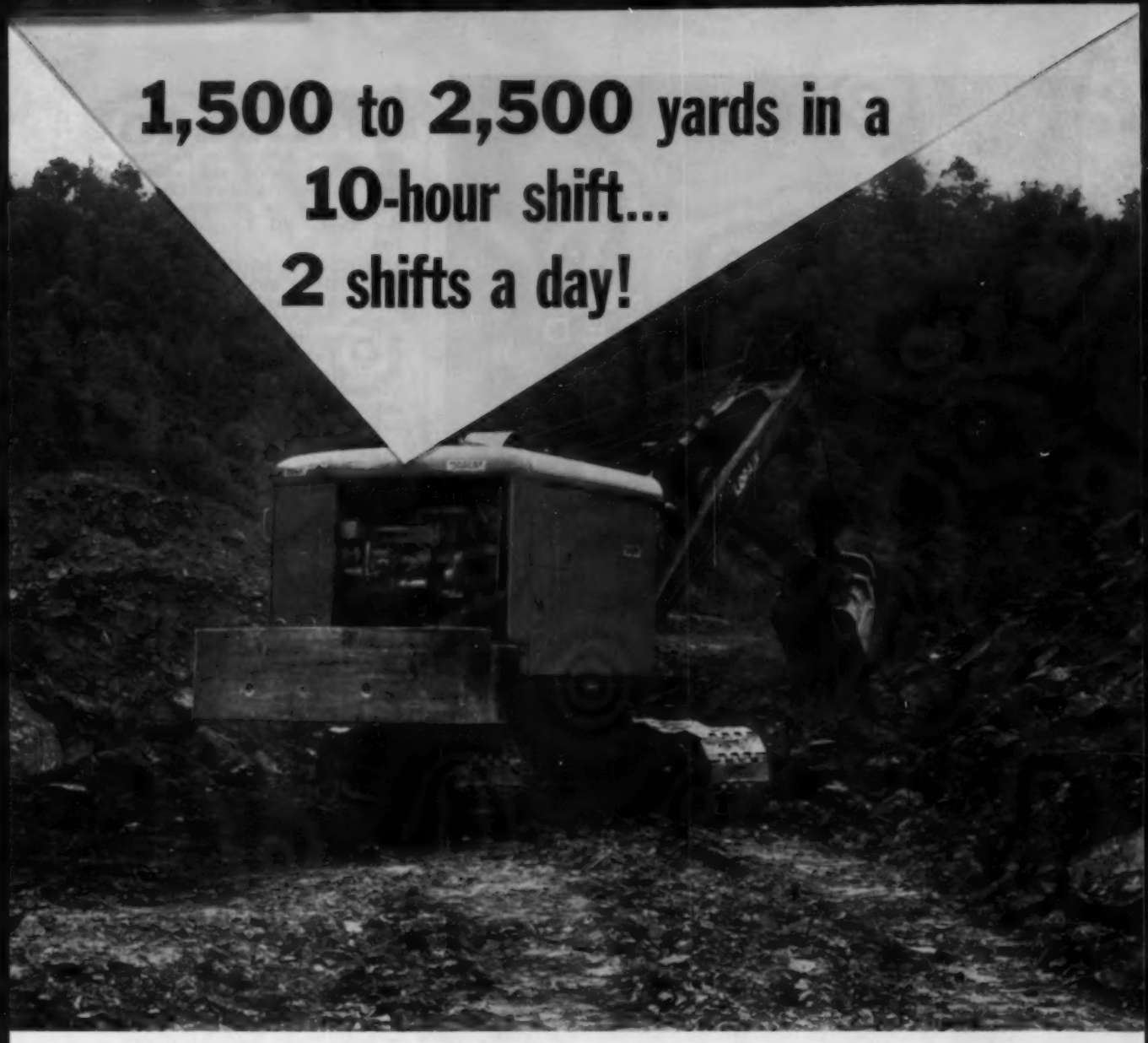
POWER LUBRICATION—Schroeder Bros., Box 72, McKees Rocks, Pittsburgh, Pa., is distributing a 1-p folder describing the Hydra Luber, a power mechanism that is said to deliver instant lubrication for mechanized mining. The unit can be mounted on any piece of mining equipment using a hydraulic system—even on mining equipment at the working face. Manufactured by the Quaker Sales Corp., Johnstown, Pa., the Hydra Luber provides pressures up to 8,000 psi and a volume of 33 oz per min of semi-fluid grease.

FILM—A demonstration of Bucyrus Erie's Hydrocrane is contained in the film "Hydro-Magic," which the company is offering on a loan basis. In the film the Hydrocrane sets down one pound of a 9-ton load, corks a bottle and cracks eggs. To show the film get in touch with the company's publicity department, South Milwaukee, Wisc. Running time, 23 min.

HYDRAULICS-FILM—"Hydraulic Oils," a sound film released by the Texas Co., shows the principles of hydraulic laws and demonstrates the vital part premium oils play in getting top performance and increased production from the many applications of hydraulics in industry. The Texas Co., 135 E. 42nd St., New York 17, N. Y. Running time, 25 min.

VALVES—A new Fairbanks catalog (No. 57) covering the company's line of bronze and iron body valves has been published for distribution. The 136-p hard cover catalog includes such addi-

1,500 to 2,500 yards in a 10-hour shift... 2 shifts a day!



This Lorain shovel is cutting bank down for Bolling Coal Co. of Pound, Va. Swinging 90° to 180°, it dumps for a CAT* D8 Tractor with bulldozer.

In a 10-hour shift, the shovel and 'dozer move 1,500 to 2,500 yards. They work two shifts a day and "since we've had them," says J. Shelton Bolling, "we've had practically no down time. You don't have much lost time with Cat-built equipment."

Powering Bolling's shovel is a dependable Caterpillar Engine—a D326, one of a complete line of modern heavy-duty diesels. Owners everywhere like the four-cycle design of these diesels; it means a longer power stroke, smoother and more efficient operation than you can get from two-cycle engines. And owners also like Caterpillar's exclusive fuel injection system; it lets you use low-cost No. 2 furnace oil without fouling.

Your dealer has Caterpillar Engines up to 650 HP (maximum output capacity). These are all *honestly rated* engines; a signed, *notarized* certificate backs up the rating. Know any other engine manufacturer who dares offer such certification?

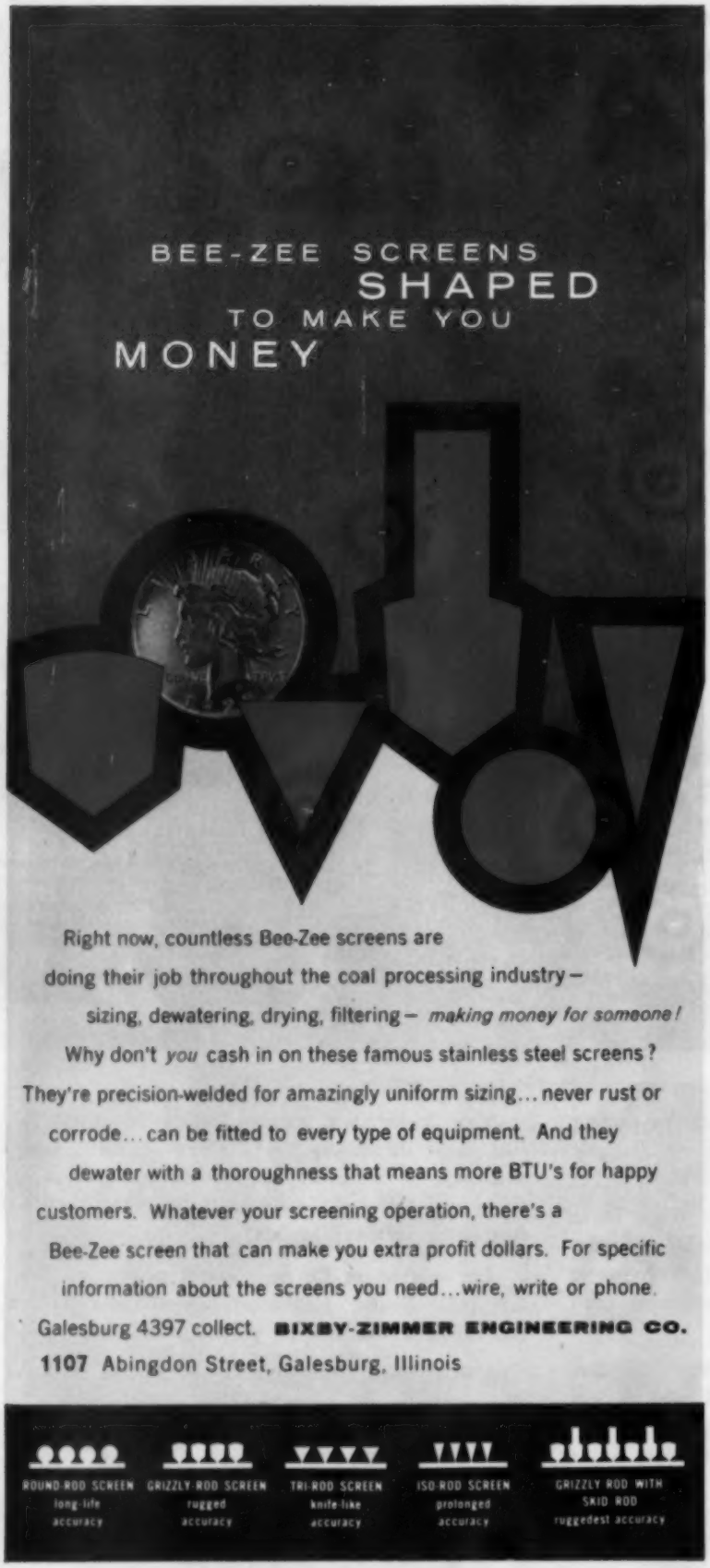
For original or for replacement power, see your Caterpillar Dealer. Remember him, too, for prompt and expert service, and for parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

QUARTER CENTURY OF DIESEL LEADERSHIP



Right now, countless Bee-Zee screens are doing their job throughout the coal processing industry—sizing, dewatering, drying, filtering— *making money for someone!*

Why don't *you* cash in on these famous stainless steel screens? They're precision-welded for amazingly uniform sizing... never rust or corrode... can be fitted to every type of equipment. And they dewater with a thoroughness that means more BTU's for happy customers. Whatever your screening operation, there's a Bee-Zee screen that can make you extra profit dollars. For specific information about the screens you need...wire, write or phone. Galesburg 4397 collect. **BIXBY-ZIMMER ENGINEERING CO.**

1107 Abingdon Street, Galesburg, Illinois

Equipment News (*Continued*)

tions as the renewable seat ring bronze gate valves, composition disc bronze swing check valves and solder end glove valves with drain. Copies are available from the Fairbanks Co., Catalog Dept., 393 Lafayette St., New York 3, N. Y.

HEAVY DUTY MINING MACHINERY—"Modern Mining," a catalog of heavy duty machinery used in today's mines, is being distributed by the Caterpillar Tractor Co., Advertising Div, Peoria, Ill. The catalog (Form 32554) shows crawlers, wheel tractors, tractor shovels and motor graders in job situations. Text and on-the-job photos are used.

TRACTOR SHOVEL—The Yale & Towne Mfg. Co., Batavia, N.Y., has issued a 6-p brochure describing the company's new 2-yd Model 154 Trojan tractor shovel. Pointed out by Yale & Towne are such tractor shovel features as low load carrying position, independent bucket action, reverse curve safety arms and straight-line horizontal thrust.

HEAVY MEDIA SEPARATION—The Ore & Chemical Corp., Div. of Mining & Milling Machinery, 80 Broad St., New York 4, N.Y., has prepared a 6-p folder in which the company describes the OCC vessel. Covered is OCC's installation, product flow, operation, drive, separation pool, power and maintenance. The vessel's operation is illustrated by a cross section drawing. In addition the folder features the company's pilot plant at White Haven, Pa., where a commercial-size system will treat truck or carload samples of material supplied by potential customers.

AIR CONTROL DEVICES—A new brochure (No. 80) has been published by the Perfecting Service Co., to explain the company's line of PSC air control devices, such as filters, regulators, lubricators, dehumidifiers, automatic drain traps and quick coupling. Address: 332 Atando Ave., Charlotte 6, N.C.

SNOW - COAL LOADERS—Barber Greene Co., 400 No Highland Ave., Aurora, Ill., will send on request an 8-p folder describing the year-round snow loader, which doubles as a coal loader—or as an aggregate loader. Reportedly the unit will load coal trucks in 3 to 4 min, according to the bulletin.

CONVEYOR BELT—The Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Inc., Boston 3, Mass, is making available a revised folder giving up-to-date information and specifications on the complete line of Boston high tension belts. The folder includes the latest and most comprehensive data available, according to the company. Box 1071, Boston 3, Mass.

CAR SHAKER—The features of the Allis-Chalmers car shaker are described

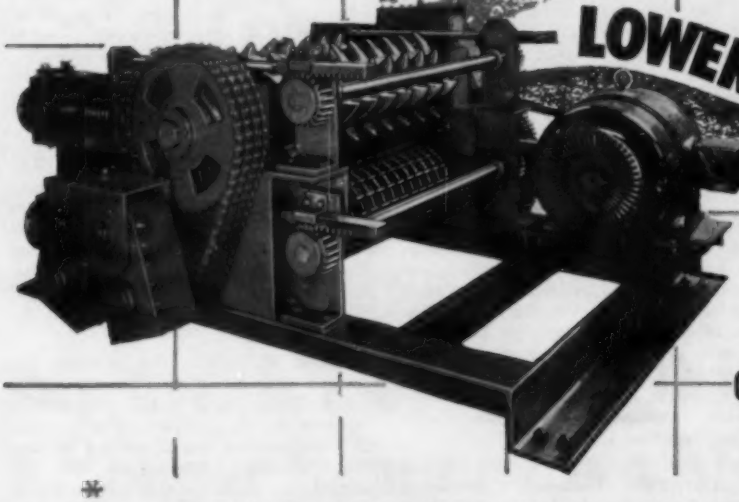
the HANNA* story about... GUNDLACH crushers

The GUNDLACH CRUSHER crushed more coal in 9 months than previous crushers crushed in a full year!

INCREASED PRODUCTION!

The GUNDLACH CRUSHER averaged 390 TPH crushing over 1,000,000 tons with total maintenance cost... only $318.00

LOWER MAINTENANCE!



Or a Maintenance Cost of 32¢ per 1000 Tons!

*

In January 1956, Hanna's Georgetown, Ohio Preparation Plant, one of the largest coal cleaning plants in the United States, installed their first **GUNDLACH** Crusher which was required to reduce 7" x 1¼" washed coal to 1¼" top size at a rate of 350 TPH.

Prior to the installation of the **GUNDLACH** Crusher, Hanna encountered trouble with an oversize product (plus 1¼") overloading the recirculation screens and conveyors, which in effect decreased overall plant capacity.

Not only did the **GUNDLACH** Crusher more than meet the capacity required, but it also eliminated the overloading condition in the recirculating equipment which greatly increased overall plant capacity. In addition the **GUNDLACH** Crusher as compared to the crusher it replaced reduced the percentage of fines, consequently better screening resulted. It delivered an average of 390 TPH, crushing over a million tons from Jan. 13 to Oct. 31, 1956 and . . . at the relatively negligible low cost of only $318.00 for total maintenance, broken down as follows:

Replacement Parts: (Includes welding rod for tooth build-ups)	$ 36.00
Labor: Hanna's actual cost for tooth build-ups and installation. (Some at overtime rate)	$282.00
Total cost per 1,000,000 tons	$318.00

BECAUSE OF THE OUTSTANDING PERFORMANCE OF THIS CRUSHER, HANNA HAS RECENTLY PURCHASED FOUR MORE GUNDLACH TWO-STAGE CRUSHERS.

Perhaps we can help you as we have helped Hanna. We have a crushing engineer in your area, just give us a call.

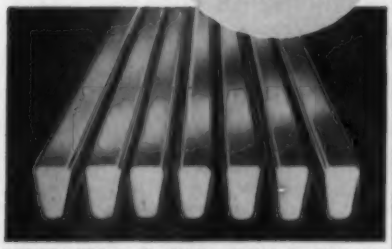
T. J. GUNDLACH MACHINE CO.
DIVISION OF J. M. J. INDUSTRIES, INC.
BELLEVILLE, ILLINOIS

HERE IS A NEW

LARGE SIZE WIRE

Kleenslot

PREPARATION SCREEN



WEDGE-WIRE profile #217 - .312 high, .187 wide
#230 - .375 high, .191 wide

Especially designed for extended life in abrasive applications. Possesses the necessary construction features to easily maintain openings from ½ inch to as close as 1 m.m. Available in many metals. Furnished in guard bars and special shapes or designs. Adaptable to vibrator applications.

with *IFA

*INDEPENDENT FLEXING ACTION—Unique construction permits individual wires to "flex" independently for greater screening capacities and abilities while maintaining "rigid" requirements.

write for prices and details

WEDGE-WIRE CORPORATION
Wellington, Ohio

Equipment News (*Continued*)

in Bulletin 07B7221B, which can be had on request from the company at Milwaukee 1, Wis. Designed for push-button unloading from open, hopper-bottom gondola cars, the car shaker is equipped with lift bars with spaced holes to facilitate centering on car eaves.

DIAMOND BITS—A new general catalog covering Hoffman "oriented diamond" drill bits has been released for distribution by the Hoffman Bros. Drilling Co., Punxsutawney, Pa. The catalog lists sizes, selling charges, weights and uses, and is designed for quick reference. Price sheets are being distributed with the catalog.

TRANSMISSION PRODUCTS—Catalog 914, an 88-p booklet featuring Jeffrey transmission products and their uses in elevating and conveying machinery, is being distributed by the Jeffrey Mfg. Co., Columbus 16, Ohio. Included is information on shaft collars, couplings, clutches, pillow blocks, takeups, wheel hubs, gears, holdbacks, chains and sprocket wheels.

HYDRAULIC ACCUMULATORS—A new line of piston-type accumulators for hydraulic service is described and illustrated by the manufacturer, Parker Appliance Co., in Catalog 1530. The line of accumulators includes 14 models ranging in oil capacity from 10 cu in to 10 gal. The catalog is available from H. E. Lewis, Industrial Hydraulics Div., Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, Ohio.

PREPARATION—Universal Engineering Corp., Cedar Rapids, Ia., is publishing a new condensed catalog of its products line. The 20-p brochure illustrates the line and contains specifications on crushing, screening, washing, loading, feeding and conveying equipment.

WIRE ROPE ABRASION—Leschen Wire Rope Div., H. K. Porter Co., Inc., is distributing Bulletin 101 entitled "Abrasion." Inside the bulletin Leschen describes the principal causes of abrasion, naming it the most common and most destructive enemy of wire rope. The company also lists a number of suggestions for minimizing abrasive effects. Public Relations, Leschen Wire Rope Div., 2727 Hamilton Ave., St. Louis 12, Mo.

HUBS AND BUSHING—Browning steel hubs and malleable split taper bushings are described in Catalog HB-101-A by the Browning Mfg. Co., Maysville, Ky. In the catalog Browning points out that it makes 10 stock sizes of steel hubs plus three made-to-order sizes that will accommodate all sizes of split taper compression bushings. Browning says the units will provide a simple and economical means for mounting fans, impellers, gears, plate sprockets, conveyor pulleys, rollers, drums, sheaves, couplings and a number of other items that require shaft mounting with a positive locking clamp fit.

GROUND ALARM—Bulletin GI 574-2, published by the Excel Electric Service Co., tells why and how the company's ground alarm takes the guess work out of detecting faults in ungrounded and modified grounded electrical distribution systems. Address: 2121 South Western Ave., Chicago 8, Ill.

WEIGHT MEASUREMENT AND CONTROL—"Weight . . . Its Measurement and Control," a publication of Weighing & Control Components, Inc., Hatboro, Pa., contains comprehensive coverage of bulk weighing. The bulletin compares batch-in, batch-out, and continuous weighing processes. In addition it explains how an automatic weighing system can be assembled by building-block techniques and with Weighing & Control's unitized weighing components. The publication is Bulletin No. 12. The company's address is 378 Lincoln Ave., Hatboro, Pa.

MANUAL MOTOR STARTERS—GEA-6358A is an 8-p trade bulletin covering the new small-size General Electric "100 Line" manual starters for fractional and integral horsepower motors up 7½ hp. The bulletin includes information on application and installation. General Electric Co., Schenectady 5, N.Y.

MOTOR SCRAPER—The recently developed TS-160 motor scraper being manufactured by the Contruction Equipment Div., Allis-Chalmers Mfg. Co., is described and illustrated in Catalog MS-1226. The 7-yd (9.5 yd heaped) scraper's performing ability is covered in detail. Address: Milwaukee, Wis.

HOSE FITTINGS—The Le-Hi Div., Hose Accessories Co., 2704 No. 17th St, Philadelphia 32, Pa., will send on request Bulletin 140, which describes brass hose fitting for low and medium pressure. The fittings are recommended for conveying air, spray, steam, water.

EXPLOSIVES BAGS—Specialized bags manufactured by the Chase Bag Co. for explosives are the subject of a booklet being distributed by the company from its Specialty Div., 309 W. Jackson Blvd., Chicago 6, Ill. The booklet features the company's gusseted "Protex" bag, which is said to have wide appeal in mines using ammonium nitrate.

PILLOW BLOCKS—Spher-Align pillow blocks, a recent addition to the Dodge Mfg. Corp.'s line of mounted bearings, are the subject of Bulletin A668, a Dodge trade publication. The bulletin contains tabulated data on dimensions, shaft sizes, weights and radial load ratings. Included are two pages of photographs showing 16 pillow blocks of ball bearing, roller bearing and sleeve bearing types. Dodge Mfg. Corp., Mishawaka, Ind.

THE BOSS SAYS:

"My DW21s move more dirt cheaper, faster, longer than any machine in its class"

The boss—Superintendent Charles Lowe of the C. P. Furgate Company—uses his two CAT* DW21 Tractors with No. 470 Scrapers to remove 40 to 50 ft. of overburden from a 36-ft. seam. Mr. Lowe relies on a 100% Caterpillar spread of high production on this strip mining job one mile east of Wise, Virginia.

A Caterpillar D9 Tractor with No. 9S Bulldozer push-loads and handles the dirt spread by the DW21s, and a D8 cleans up around the shovel and levels out. The DW21s move up to 3500 cu. yd. of dirt per 10-hr. day—a credit to the speed and stamina of this rugged Cat two-wheel Tractor plus the LOWBOWL design of the No. 470 Scraper.

On handling ease of the DW21s, Superintendent Lowe quotes his operators: "We find them easy to operate—no tricks necessary—and they are 100% when it comes to maneuvering in tight squeezes."

The extra-long life, proven durability and handling ease of rugged Caterpillar equipment are the reasons why contractors and operators prefer it when high production counts. For details, get in touch with your Caterpillar Dealer—the same man you contact for replacement parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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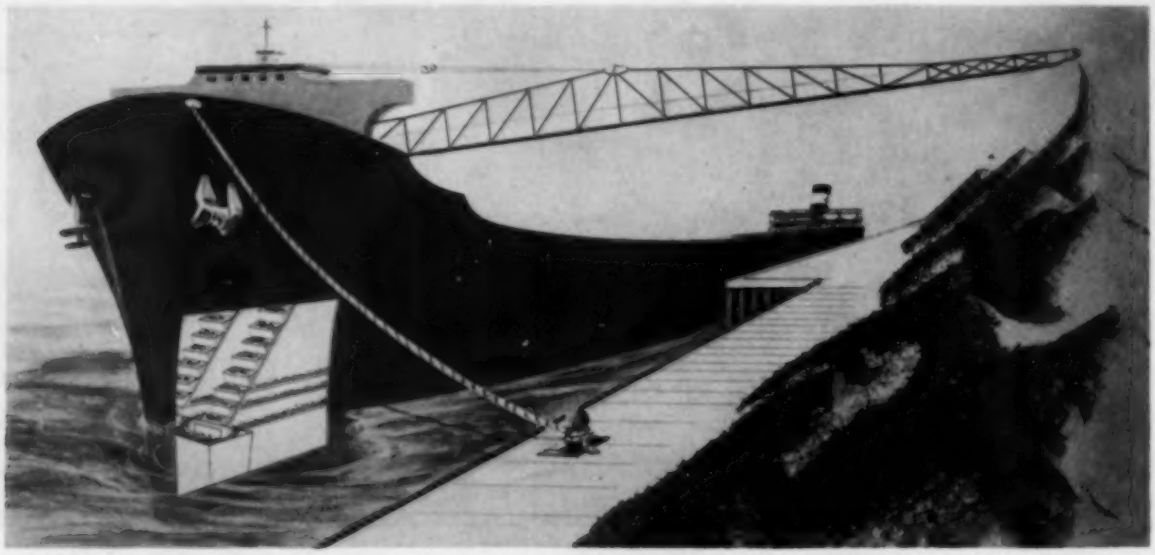
NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

News Roundup



SUPER COLLIER is 635 ft long and has a loaded draft at wharf of 30 ft. Coal is carried in eight specially designed holds equipped with 150 hydraulically operated gates through which the coal flows by gravity to three 453-ft conveyors running lengthwise through the ship. The self-unloading boom conveyor, pivoted at the spar deck, can swing through a horizontal arc of 100 deg on either side and can be raised to permit piling coal 60 ft high. The boom can be swept into a shoreside hopper or swept in a series of arcs to stockpile coal on a ground storage area.

Pocahontas Steamship Co. Orders Super Collier

◄ **ONSHORE TAKE-AWAY SYSTEM** for use with super collier is under construction at the Salem Harbor Station of New England Power Co. It has an underground belt conveyor running from ground storage area and feeding into plant. Belt is enclosed in a 10-ft pipe which is equipped with gates that permit coal to flow by gravity from open storage area. The system (1) eliminates conventional discharging facilities such as bridges, stackers and towers needed to unload today's colliers, and (2) allows super collier to operate at its maximum discharge rate. Officials say that equipment for the system requires relatively small investment.

The Pocahontas Steamship Co. last month announced placing an order to build the first of a fleet of three self-discharging "super colliers."

The new collier—scheduled for delivery in October, 1958—will have a 24,000-ton capacity and will unload coal at the rate of one ton per second (3,600 tph). Most of today's colliers carry 11,500 tons and take about 50 hr to discharge (300 tph).

Horace E. Davenport, vice president of the steamship company, said the new super collier answers the many problems of large volume coal deliveries to wharf and plant. It will make possible savings in onshore investment and coal handling costs.

One of the ship's most valuable features is a dust-free discharge system that allows high-speed discharge of dry coal without air pollution. Other features and details are noted in the accompanying pictures. Push-button controls permit complete, instantaneous operation of the entire self-loading mechanism, and lead to lower handling costs.

The Pocahontas Steamship Co. now operates four conventional 12,000-ton colliers in the Atlantic coastwise and European trade. The firm plans to replace this fleet with new super colliers as soon as onshore plants are built or redesigned to take them.

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1000 and 1

WHYTE STRAND

WIRE ROPES

Each designed to give you the correct wire rope for your equipment. Whatever your equipment needs, there is a Macwhyte Wire Rope to serve you the sure, dependable way. WHYTE STRAND Wire Ropes by Macwhyte are produced to meet every job specification under all conditions, PREformed for flexibility, and Internally Lubricated for outstanding service. Macwhyte Wire Rope is available in stock for immediate delivery.

Macwhyte General Wire Rope Catalog G-16 will prove invaluable to you. For your free copy, write on your company letterhead to:

MACWHYTE COMPANY
2906 Fourteenth Avenue, Kenosha, Wisconsin

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel and Plastic Coated Wire Rope, and Wire Rope Assemblies. Special catalogs available.

MILL DEPOTS: New York 4, 35 Water St. • **Pittsburgh 36,** P. O. Box 10916, 353 Curry Hollow Road • **Detroit 3,** 75 Oakman Blvd. • **Chicago 6,** 228 S. Desplaines St. • **St. Paul 14,** 2356 Hampden Ave. • **Fort Worth 1,** P. O. Box 605 • **Portland 9,** 1603 N. W. 14th Ave. • **Seattle 4,** 87 Holgate St. • **San Francisco 7,** 188 King St. • **Los Angeles 21,** 2035 Sacramento St.

Lignite Process In Overseas Trial

A lignite-processing method developed by the USBM may soon be used to provide fuel for generating low-cost power in a fuel-short, remote area of South India, the Department of the Interior announced late this summer.

Experiments at USBM's Denver, Colo., laboratories have shown that raw lignite from a large deposit at South Arcot, Madras, India, can be upgraded to produce superior fuels for certain uses. Pilot-scale tests will be conducted soon in India with a replica of USBM's equipment.

Using an "entrained state" drier, in which powdered lignite is dried while suspended in a stream of hot gases, Federal researchers found that the Indian lignite could be processed into a satisfactory low-moisture fuel which can be briquetted without a binder to make a product for industrial and home use.

The dried lignite can also be carbonized by USBM's "fluidized-bed" process to yield 25 to 40 gal of crude tar and about 1,300 lb of char per ton. The tar is a potential source of valuable chemicals while the char, besides being an excellent fuel, can be used to produce synthesis gas for chemical products or producer gas for special fuel applications.

USBM director, Marling J. Ankeny, said entrained-state drying already is being used commercially in the U. S. to supply the fuel that powers a large aluminum plant at Rockdale, Texas. Fluidized-bed carbonizing is also being tried at the same power installation.

A copy of the Report of Investigations 5351, "Utilization of South Arcot, India Lignite," can be obtained from the USBM, 4800 Forbes St., Pittsburgh, Pa.

Island Creek Welcomes New Towboat

The Island Creek Fuel & Transportation Co., Huntington, W. Va., officially put its sixth diesel towboat into the Ohio River coal trade service Aug. 28. The twin-screw 148-ft vessel—built by Dravo Corp., Pittsburgh, Pa.—was christened the I. F. Freiberger, in honor of Island Creek's board chairman, by Mrs. Fannie Freiberger, Cleveland, Ohio.

The new vessel is a sistership to the **Raymond E. Salvati** which Dravo delivered to Island Creek last summer. Other ships in the Island Creek fleet include the **James D. Francis**, the **Island Creek**, the **Porpoise** and the **Black Onyx**.

When taking the Ohio River upstream, the I. F. Freiberger is designed to tow 20 standard 900-ton coal barges or 15 1,500-ton barges. Powering the vessel are twin Enterprise marine diesel engines, equipped with reverse-reduction gears. Each engine delivers 1,280 continuous hp at a propeller speed of 185 rpm.

The ship's pilothouse features a radar set, steering control levers, ship-to-shore radio, a teletalk system, alarm controls and spotlight and floodlight switches and controls. The steering levers operate a hydraulic, six-rudder system which provides for flank and forward steering.

Welfare Fund Issues Report for 1956-57

The UMWA Welfare and Retirement Fund reported Sept. 3 an unexpended balance of $145,321,221.85 for the fiscal year ending June 30, 1957, compared with $130,172,370.58 for the previous year.

Total revenues for 1956-57 were $157,093,034.71. Expenditures amounted to $141,944,183.44, of which $138,018,257.17 were payments aiding 215,702 beneficiaries. All administrative costs of the fund, including those of its Washington headquarters and 10 area medical offices were 2.8% of total expenditures.

Payments to beneficiaries included $75,002,584.12 for pensions. On June 30, 63,009 retired miners received $100 monthly pensions, in addition to Federal Social Security or other income.

Fund expenditures of $59,584,594.13 for hospital and medical care benefits provided 1,631,144 days of hospitalization for 93,679 beneficiaries. Medical and surgical cases for hospitalized cases involved 1,556,111 visits by physicians. Specialists provided additional services through 885,944 office and out-patient clinic consultations.

Funeral expense and benefits for widows and survivors, amounting to $3,353,870.94, aided 9,260 widows, orphans and other survivors of deceased miners. Additional payments of $77,207.98 in mine disaster benefits aided families of 251 miners killed or seriously injured in mine disasters during the year.

Exporters See New Overseas Peak

Bituminous and anthracite overseas shipments (exc. Canada) should reach a record 59 to 61 million tons in 1957, compared to last year's 51 million tons, John S. Routh predicts. Exports to Canada, the president of the Coal Exporters Association of the U. S. adds, should hit from 22 to 23 million tons, or about the same as last year's 23 million tons.

Allowing about 3 million tons for overseas anthracite shipments in 1957, industry observers figure Mr. Routh sees a 56- to 58-million ton year for overseas bituminous. This tonnage—8 to 10 million tons more than last year—marks some upward revision of previous industry estimates. A National Coal Association forecast early in 1957, for example, put overseas bituminous tonnage at 55 million tons. Later in the year, because of the mild winter and increasing stockpiles of American coal in Europe, NCA scaled its initial forecast down to 53 million tons.

Speaking for the exporters association, Mr. Routh said he formed his opinion on export volume after reading many different estimates recently published. "Since Labor Day, there has been a considerable resumption in buying which reflects a stabilization of ocean vessel rates at a very low level. This permits foreign buyers to fill their coal requirements with U. S. purchases at a lower delivered cost."

House Unit Makes Coal Research Bid

After a 15-mo study, a special House of Representatives subcommittee report has asked the federal government to

Compass No. 3

OF THE CLINCHFIELD COAL COMPANY

a modern new coal preparation plant...

(tailor made)

Engineered and built by

Industrial

"Industrial" is proud to have been chosen to build this important plant for the Clinchfield Coal Company.

"Tailor made" to fit the individual conditions at their Compass No. 3 Mine, it is designed to clean and size coal that Clinchfield customers require for their particular uses.

A special feature is the 3-track 500-foot long shuttle loading in which movable belt conveyors replace the conventional booms.

By every measure Compass No. 3 preparation plant is "tailor made" for greatest economy—consequently most profitable operation.

INDUSTRIAL

Engineering & Construction Co., inc.

FAIRMONT, W. VA.

General Office
First National Bank Bldg.
Fairmont, W. Va. Phone 7500

expand greatly its research and development program for coal.

"The development of this great resource and revival of this industry should be a national undertaking of the highest priority," the subcommittee said. "This report is a first blueprint for such an undertaking."

A major recommendation was the establishment of an independent Coal Research and Development Commission, to be appointed by the President. The commission should work with the USBM and other institutions to set up "a broad-gauged program to develop new uses for coal, improve and expand existing uses, reduce cost of coal production and distribution, and emphasize uses and developments of particular value to small producers."

The new commission would have an initial recommended appropriation of $2,000,000 to co-sponsor and promote coordination of research programs in all types of institutions. Advisory committees to work with the commission—made up of coal producers, manufacturers and users of coal—were urged in the report.

The committee report also recommended that depletion allowance rates for bituminous and anthracite be revised to provide added reserves for use in research, engineering and proving-ground operations.

Several subcommittee members reportedly intend to introduce legislation implementing the report. A strong drive is expected to be made for such legislation in the next session of the 85th Congress.

Richard Taft Joins Coal Age Staff

RICHARD J. TAFT, a graduate of Dartmouth College in 1956, joined the *Coal Age* editorial staff Sept. 17 as assistant editor, succeeding Christopher Elias, who transferred Sept. 1 to the editorial staff of *Business Week*, another McGraw-Hill publication. Mr. Taft will write news and will handle production duties. At Dartmouth, he majored in English and writing and was associated with local publications, preparing articles on a wide variety of subjects. Mr. Taft, born in New York City, Feb. 10, 1935, was an officer of Phi Sigma Kappa and edited fraternity news publications. He has studied law and plans to work toward an advanced degree in writing.

New Scholarships By Johnstown Coal

Johnstown Coal & Coke Co. and subsidiaries, Johnstown, Pa., offer two 4-yr scholarships at $3,000 each in mining engineering, available to employees, sons of employees or senior students in high schools in the areas of the company's operations in Pennsylvania and West Virginia. The West Virginia award is for study at West Virginia University, and the Pennsylvania award at Penn State University or the University of Pittsburgh. Application blanks may be secured from mine superintendents at Johnstown Coal & Coke properties or from principals at the following high schools: In Pennsylvania, Adams-Summerhill, Beaverdale-Wilmore, Portage Joint; and in West Virginia, Cowen, Nicholas County, Richwood and Webster Springs.

Coal Asks Fair Shake

Coal doesn't seem to be getting a fair shake these days. The Anthracite Institute says that the government has been disregarding the economic advantages of coal, in favor of other fuels. The coal industry has been combating this govern-

PENNSYLVANIA STATE CHAMPS—Robena No. 2 mine, U. S. Steel Corp., Greensboro, Pa.: Lewis Evans (standing, left), Pa. Dept. of Mines; George H. Deike, chairman of the board, Mine Safety Appliances Co.; Captain John Chambers; Andrew Hatalla; William Humbert; Joseph Simon; Instructor George Yurkrenic, and George Trevorrow, BCOA. Kneeling, left to right, are George Rattay Jr.; William Lee; Robert Monaghan and Louis Kopec.

Robena Team Wins Pennsylvania State Contest

The first-aid team representing Robena No. 2 mine, U.S. Steel Corp., Greensboro, Pa., headed by Captain John Chambers won top honors in 15th annual Pennsylvania State Bituminous First Aid Contest at Carmichaels, Pa., Sept. 7. The Robena team scored 99.933 points out of a possible 100. The team from Russelton mine, Republic Steel Corp., Russelton, Pa., was second with 99.867, and Renton mine, National Mines Corp., Renton, Pa., was third. Other winners were Cardiff mine, Cardiff Imperial Coal Co. and Kramer mine, Northwestern Mining & Exchange Co.

The Robena team was awarded a plaque by Mine Safety Appliances Co. and $350 in cash. The Russelton team won the United Mine Workers trophy and $175, and the Renton team won the National Coal Association trophy and $140. The Cardiff team's prizes were flame safety lamps donated by the Pennsylvania Dept of Mines and Mineral Industries and $105. The men from Kramer were awarded flashlights by the Department of Mines and Mineral Industries and $35.

How to select the right Link-Belt chain for specific coal service conditions

FILE HARD PROMAL makes this C-131 chain conveyor especially resistant to abrasive wear. Application is a tank-type heavy media vessel.

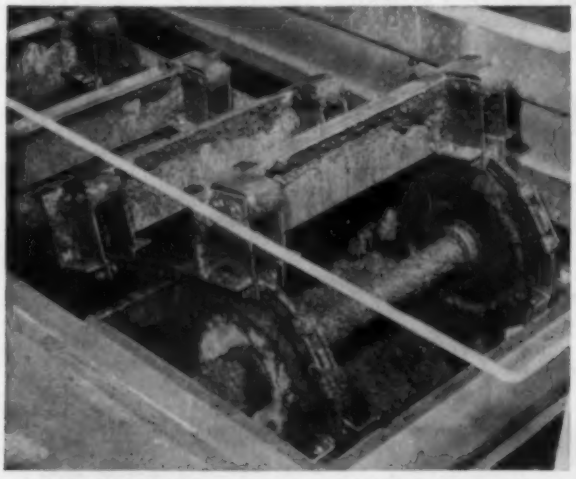
Use Class C chain for economy on drag conveyors, elevators

Here's a popular, durable, low-cost chain for elevator and conveyor applications. Because of its relatively broad top and bottom surfaces, it is particularly resistant to sliding wear, common to drag conveyor operation.

C Class chain combines two types of link construction into an economical chain assembly. Center links consist of simple, rigid and rugged castings . . . sidebars are made from selected steel . . . steel connecting pins are locked in the sidebars and only rotate in each end of the center link where generous bearing area is provided.

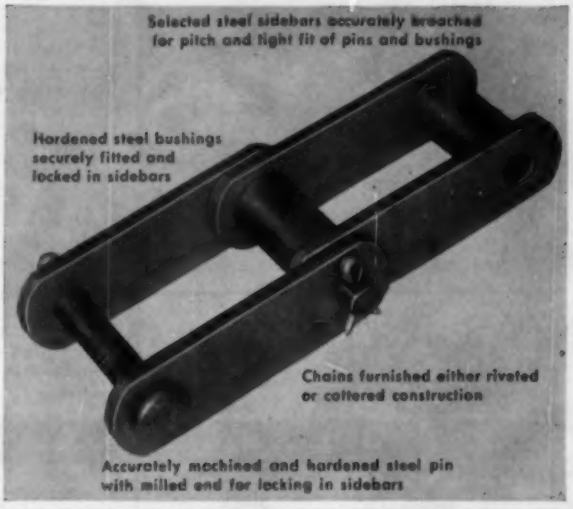
When conditions demand, Link-Belt manufacturing and application knowledge will produce a chain specifically tailored for your service. For example, center links are available in Promal and file hard Promal as well as malleable iron. Specially treated joints and special hardening in localized areas give greater wear-resistance. A wide variety of attachments is offered.

Lightweight rivetless chain is ideal for flight conveyors



FLIGHT CONVEYOR in coal preparation plant is a typical application of Link-Belt rivetless chain. It is ideally suited to this service, being high in strength and resistance to shock loads.

Although it has the light weight desired for long flight conveyors, Link-Belt rivetless chain offers the high strength at relatively low cost, needed to meet sudden impacts and heavy overloads. Open joint construction makes it ideal for operating in materials that have a tendency to pack. Simplicity of chain design permits dismantling by hand . . . lengths can be altered without tools.


Selected steel sidebars accurately broached for pitch and tight fit of pins and bushings
Hardened steel bushings securely fitted and locked in sidebars
Chains furnished either riveted or cottered construction
Accurately machined and hardened steel pin with milled end for locking in sidebars

LINK-BELT SS BUSHED CHAIN is especially engineered to resist chain joint wear under gritty or abrasive service.

SS bushed chain has extra-hard joint surfaces for abrasive jobs

Link-Belt SS bushed chain resists the abrasive wear encountered in coal handling operations. Hardened joint surfaces—up to five times harder than standard malleable, resist the cutting action of abrasive particles.

Sidebars of selected bar steel are accurately formed and machined for tight press fit of pins and bushings. These straight steel sidebars with hardened steel pins and bushings provide strength to prevent distortion under continuous heavy loads.

Many sizes of these heavy-duty chains are interchangeable with Link-Belt "C" Class. A wide range of attachments makes them adaptable to specific coal service requirements.

HEADQUARTERS for chains, sprockets and other Link-Belt conveying and mechanical power transmission products is your nearby Link-Belt factory branch store or authorized stock-carrying distributor.

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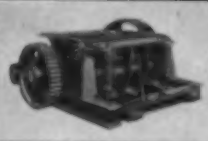
CRUSHERS for COAL and REFUSE

SINGLE ROLL

Rockmaster — High in capacity and ruggedly constructed, it crushes hardest rock, slate and similar mine refuse.

Super Black Diamond — An all-steel, intermediate-duty crusher, this provides many Rockmaster features at moderate cost.



Black Diamond — Steelstrut Toggle protection against uncrushable materials and quick size adjustment are features of this fabricated steel crusher.

Bantam Buster — This is a portable, low-cost unit with a high ratio of reduction. Trouble-free maintenance is a feature.

DOUBLE ROLL

Black Diamond Double Roll — This was designed for moderate to fine reduction of coal where a low ratio of reduction is satisfactory.

Heavy-Duty Double Roll — Economical and noted for service, it is ideal for fine reduction of mine refuse.

TRIPLE ROLL

Black Diamond Triple Roll — Radically new 2-stage design reduces run-of-mine and direct open pit feed coal to fine sizes.

Bulletins Available on All Crushers

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News Roundup *(Continued)*

ment switch to oil or gas which has become a trend in its departments. In most of these cases, the change from anthracite to competitive fuels has been without logical reason, the Institute says.

For example, a recent conversion was made in a Philadelphia housing project. The change was supported by the Housing and Home Finance agency, despite a thorough study and report by anthracite engineers showing clearly that the move could not be justified economically. In its recent report on coal research, the House Interior and Insular Affairs Subcommittee criticized the government for its spendthrift policy on fuels, citing a number of Government-owned boiler plants now using oil or gas despite the fact that coal would be cheaper and more practical. The coal industry should not have to fight to sell its product when its superiority, as shown by many previous tests, is clear, the institute points out. Therefore, the anthracite industry is endorsing the Subcommittee's recommendation that each agency of the government be required to consult with the Bureau of Mines before any fuel conversion comes about.

Seek Changes in Oil Import Curbs

Standard Oil Co. (Indiana) last month asked the government to drop its present plan to curb oil imports in favor of a 9.6% ceiling on foreign oil refined by each oil company east of the Rockies. John E. Swearingen, executive vice president of the oil company, attacked the method by which the voluntary plan has allocated imports. New importing companies, such as Standard of Indiana, may only increase their crude imports by a maximum of 12,000 bbl a day over the 1956 level. On the other hand, seven "established" importers, who have built up a high rate of imports, need only cut these imports by 10%, Mr. Swearingen pointed out. This means the established companies will be permitted to supply 15% of their refinery demand through imports of cheaper foreign crude, while "new" importing companies will be limited to a lower proportion, 4.5% in the case of Standard of Indiana.

Since the overall plan is designed to limit imports to U. S. areas other than the West Coast to 9.6% of demand, the oil executive said all companies should be permitted to import at least this much if they wish.

BCI Publishes Plant Specifications

Guide specifications for a typical low-pressure commercial heating plant is the subject of a new BCI publication for consulting engineers, architects and others having the responsibility of

Morton "Formula 5" with rust inhibitor protects your coal and your equipment

"Formula 5" is the safest, most effective freezeproofing compound you can buy. Morton "Formula 5" is specially compounded to meet the requirements set up by coal producers. Unlike ordinary freezeproofing compounds that contain corrosive chlorides, non-toxic "Formula 5" has a rust inhibitor added to help protect you (and your customers) against corrosion of motors, conveyors and other equipment.

Effective even at sub-zero temperatures, "Formula 5" not only keeps coal free-running for your customers, it also is ideal for use anywhere around your mine where icing is a problem.

"Formula 5" is economical to use

In addition to being a multi-purpose freezeproofing compound, "Formula 5" needs no mixing, no special handling. It won't cause costly delays by caking or lumping in feeders. It's a free-flowing product composed of chemically treated sodium chloride (30-70 mesh) and a special anti-corrosive compound. Just apply dry direct to coal.

"Formula 5" is treated to produce an ideal dissolving rate so that little of it is lost during initial drainage. This means more effective, more economical freezeproofing.

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☐ *Please send me your free booklet, "The Key to Low Cost Freezeproofing Application."*

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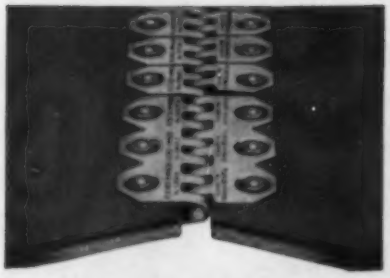

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BELT FASTENERS
for Underground
Coal Mining

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★ Field engineers are ready to assist you.

(Fasteners also available in bulk — nylon covered cable pin stock in 100 ft. and 200 ft. rolls.)

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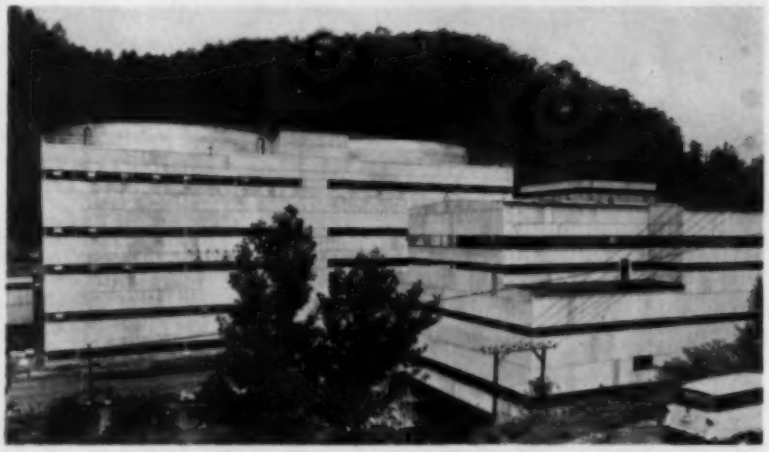

FINE COAL CLEANING SYSTEM—The Alpheus Central Coal Preparation Plant at U. S. Steel's Gary, W. Va., district, where a new fine coal cleaning system (shown at left in photograph) will enable the plant to wash all coal mined in the district before shipment to the corporation's steel plants. Prior to the fine coal addition only coarse coal, or about 50% of production, was cleaned at the Alpheus Plant. In the new cleaning process fine coal is separated from coarse by wet screening, then pumped from a fine coal sump to desiltors where the slimes or clay particles are removed. The product from the desiltors is taken to coal washing tables where additional ash is eliminated. Excess moisture is removed in centrifugal bowl filters. Upon completion of a thermal drying unit coal from the bowl filters will be dried further and combined with coarse coal for shipment.

writing specifications for coal-fired heating plants. The 51-page guide contains a combination of ideas of many consulting and fuel engineers who have specialized in coal utilization. Also included are five drawings of various boiler-and-bin arrangements. Copies of the guide may be obtained free of charge from BCI district representatives or from the office of BCI in the Southern Building, Washington 5, D.C.

Pennsylvania Group Elects Officers

Officers elected at the joint annual meeting of the Central Pennsylvania Coal Producers' Association and Eastern Bituminous Coal Association on Sept. 5 and 6 at the Nittany Lion Inn, State College, Pa., are as follows:

President, George E. Owen; vice president, Ralph H. Moore; executive director and secretary, R. T. Laing; treasurer, Walter A. Jones; assistant treasurer, C. P. O'Neill, and counsel, Frank G. Smith.

Edward G. Fox, president, Bituminous Coal Operators Association, was principal speaker at the annual banquet, Sept. 5.

Strip Regulations Appealed

Court appeal contending a Wilkes-Barre Township (Pa.) ordinance regulating strip mining and blasting is unconstitutional and inconsistent with state laws has been filed by John B. Corgan, Kingston, Pa., with hearing scheduled for Oct. 22. The township ordinance, enacted Aug. 5 and effective Aug. 18, requires that stripping contractors comply as follows:

Obtain permit from the board of commissioners and submit a map outlining the area to be stripped;

File $25,000 bond and a certificate of insurance with limits of $100,000 for personal injury and $300,000 for property damage;

Limit blasting to periods between 1:30 and 2:30 pm;

Maintain 24-hr guard;

Limit perimeter of excavation from being closer than 300 ft from any school, church, dwelling, building or highway;

Restrict operations to the hours between 6 am and 11 pm.

1,200 Coal Mines In Roof Campaign

More than 1,200 coal mines in the United States, Alaska and Canada now are enrolled in the year-long national campaign to prevent roof-fall injuries. The list of participating mines includes most of the large properties in North America, with the U. S. entries representing an estimated 80% of the Nation's total tonnage. The campaign is sponsored jointly by the American Mining Congress, Bituminous Coal Operators Association, Coal Mining Section of the National Safety Council, Mine Inspectors

GOLD BOND AIR HOSE . . . top quality air hose for the toughest underground conditions.

PYROPRENE BELTING* . . . fire resistant . . . oil resistant . . . mildew proof.

*Acceptance designation: "Fire Resistant, U.S.B.M. No. 28-7", January 27, 1956.

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Institute of America, National Coal Association, Southern Coal Producers Association, United Mine Workers of America, U. S. Bureau of Mines, and state and provincial mining departments.

West Virginia, with 409 mines enrolled, heads the list, followed by Pennsylvania with 343 mines and Kentucky with 111. Objective of the campaign is to reduce by 50% the accident toll of roof falls.

MISS ANTHRACITE, Judith McElroy, was formally crowned in ceremonies aboard a hard-coal barge in New York's East River to inaugurate the observance of National Anthracite Week, Sept. 16-22.

Gas Explosion Traps 11 Men

An explosion at Marianna mine, Bethlehem Mines Corp., Marianna, Pa., trapped 11 men Sept. 23. Six of the men were rescued after 7 hr, two men were found dead and three were missing, as this was written. The men involved were supervisors who had gone into the mine to investigate after a ventilating fan had broken down. Officials had closed the mine because of the fan stoppage and had ordered 200 miners not to report for work.

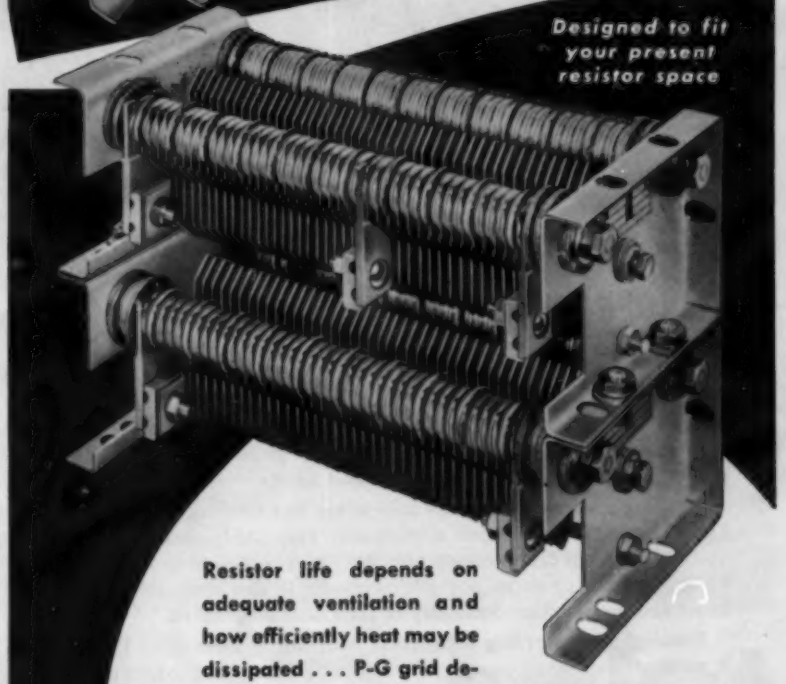
Scene of the explosion was in the vicinity of a new shaft. The cage was destroyed by the explosion, and the men were brought out in an improvised bucket.

Oglebay, Norton Plans Big Merger

Directors of Oglebay, Norton & Co., Cleveland, Ohio, and nine associated companies reportedly will present to stockholders of all companies a proposal

Resistor life depends on adequate ventilation...

Patented P-G Grid Design assures maximum ventilation



Resistor life depends on adequate ventilation and how efficiently heat may be dissipated . . . P-G grid design equalizes the amount of air space surrounding each leg or loop to obtain even heat throughout the grid area. (Note illustration.) . . . Since heat is rapidly and evenly dissipated, hot spots fail to develop and longer resistor life is assured . . . For a nonbreakable resistor (only steel and mica used) specify P-G on your next application.

P-G

The Nonbreakable Steel Grid Resistor

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Quick connection for better blasting...

AUSTIN DETONATING FUSE and CONNECTORS

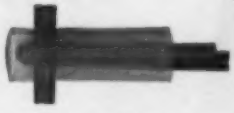
Effective blasting depends upon use of a powerful detonating fuse with proper connection between trunk and lead lines.

That explains why successful strip mines and quarries rely on Austin Detonating Fuse and plastic Connectors. This combination provides a quick hook-up of high strength fuse that won't slip, slide or lose contact in any weather or under any job condition. It also eliminates tying of knots and the resultant possibility of their becoming untied.

Blasting goes according to schedule with Austin Detonating Fuse, for it possesses more than enough power to initiate the entire charge in every hole. Protected with a waterproof covering, it is tough, but flexible . . . won't chip, peel or crack while being laid. It's insensitive to shock, abrasion and stray electrical currents.

AA-4482

First, thread fuse from shot hole through length of connector. Then, press the trunk line into the grooved slots.



Next, return the branch line through the end of the connector on the other side of the trunk line. Pull both ends of branch line tight for positive connection.

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explosives ◆ permissible dynamites ◆ mine tools ◆ detonating fuse ◆ AP drill heads ◆ Akremite ◆ primers

News Roundup *(Continued)*

to merge into a single company at the stockholders meeting Oct. 17 at Cleveland. The nine companies are Montreal Mining Co., Saginaw Dock & Terminal Co., Richwood Sewell Coal Co., Columbia Transportation Co., Ferro Engineering Co., Pringle Barge Line Co., Fairport Machine Shop, Inc., North Shore Land Co. and Standard Box Co. Common stock in the new company, to be known as Oglebay Norton Co. would be offered to shareholders of the other firms in exchange for their stock, in ratios approved by the various boards of directors. The merger will be effective on Oct. 31, if the proposal is approved.

Officers of the new company would include R. C. Norton, honorary chairman; Courtney Burton, chairman; H. S. Taylor, president, and E. W. Sloan, executive vice president, now holding these titles in Oglebay, Norton & Co.

Executive Action Can Help Coal

Several recommendations of the House Subcommittee on Coal Research can be implemented without waiting for Congress to reconvene, says Representative Elizabeth Kee (D-W. Va.). The accomplishment requires only that the Administration view the "overall energy panorama with objectivity rather than to proceed with policies that are detrimental to the best interests of the nation and to the welfare of the coal industry," Mrs. Kee said.

Subcommittee proposals which can be effectuated without legislation are: revision of government fuel-buying policies that favor coal's competitors; reduction of residual-oil imports, now in the hands of the executive department, and prohibition of imports of Canadian natural gas, a responsibility of the Federal Power Commission.

News Briefs

The Washington State Power Advisory Committee ordered an investigation of the cost of leasing coal mines in the Roslyn-Cle Elum areas.

Construction of a steam power generating plant is under consideration, and earlier studies showed that the mines in the area would not give a firm rate for supplies of coal over an extended period. Advisors of the committee have indicated that transportation and labor cost may be the primary factors in the ultimate decision.

Coal consumption by the electric utility plants throughout the country rose more than 12% in 1956 to a new high of 153,500,000 tons.

The figures are the results of a study

(*Continued on p. 142*)

GENERAL CABLE SUPER SERVICE

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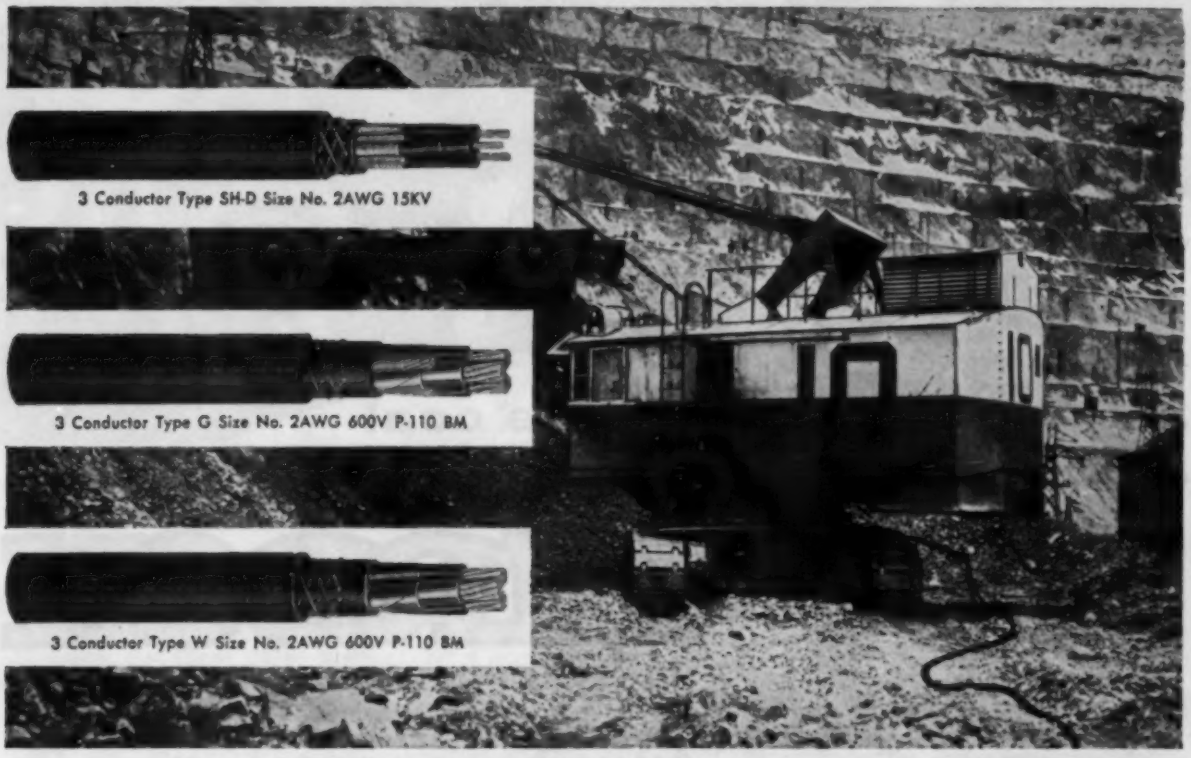
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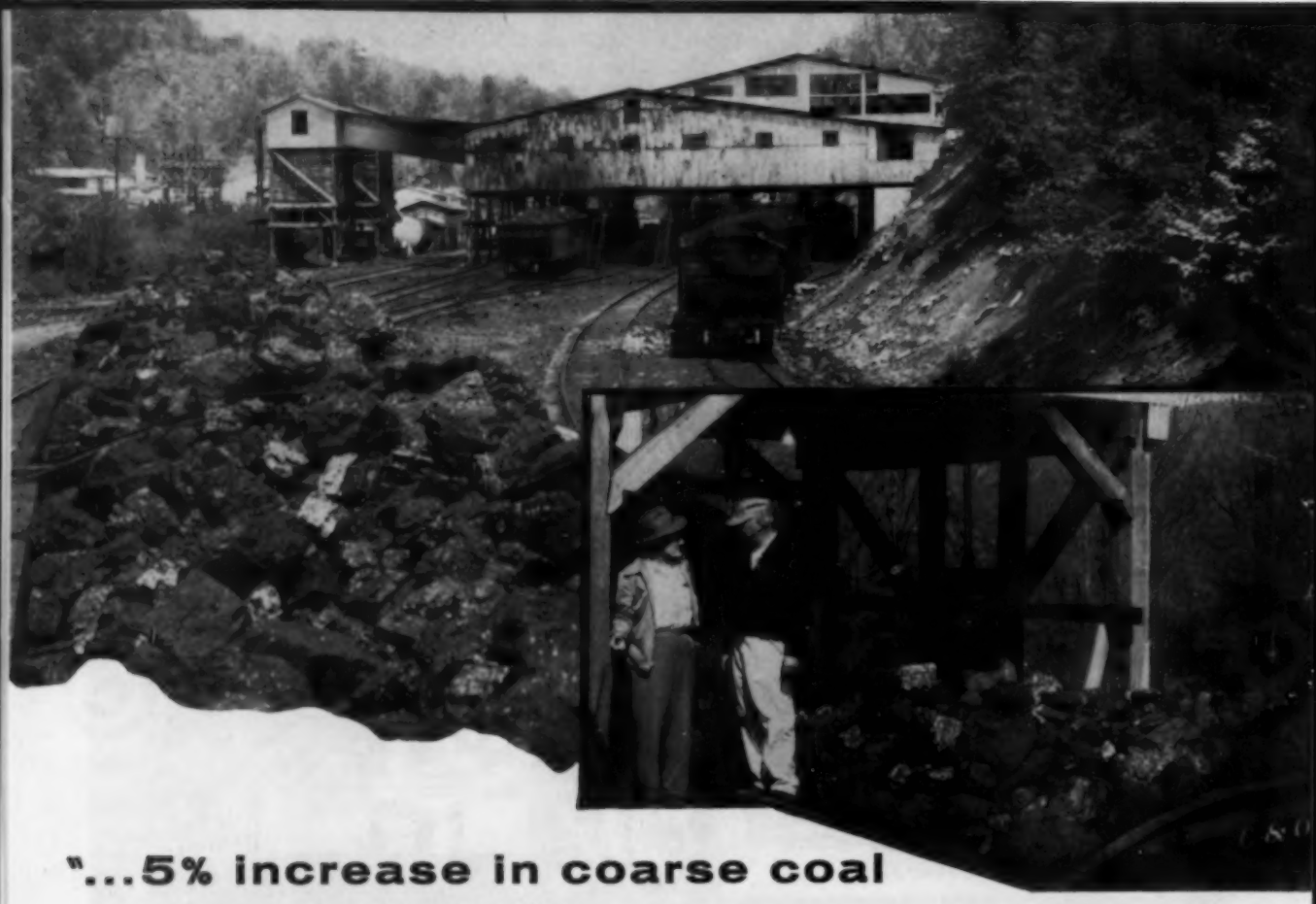

"...5% increase in coarse coal ...less degradation with AIRDOX"

NON-EXPLOSIVE MINING METHOD

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NON-EXPLOSIVE MINING METHOD

Cuts Costs 5 Ways

- Produces less fines in face preparation
- Rolls coal forward for faster, easier loading
- Easier on "tender" roofs—cuts timbering, bolting
- Lowers cleaning costs by minimizing fines
- Reduces degradation—no shattered coal

NEW RIVER IMPERIAL SMOKELESS

states J. G. McCURRY
General Manager
Imperial Smokeless Coal Company

"We have been using the Airdox method of mining for some five years now in all our deep mines. We gave it a very thorough test period and compared the results with other methods of blasting. Airdox gave us an increase of more than 5% in coarse coal. Moreover, our customers report there is *noticeably less degradation* of coarse coal when unloaded at its destination.

"We have a new mine opening this fall and expect to stay 100 per cent on Airdox."

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Camden-on-Gauley 2181

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Phone: Evansville 2-8964

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Murray 4-6564

Personal Notes

Rex M. Chaney, former member of the Washington staff of United Press, became director of public relations for the National Coal Association Oct 1, succeeding James H. Cunningham. In his new position, Mr. Chaney will be located in the NCA's Washington headquarters.

Before the appointment he was administrative assistant to Congressman Albert (D-Okla). Prior to his association with Congressman Albert, Mr. Chaney was employed by the United Press for 19 yr and was a member of the U. P. Washington staff from Dec. 1941 to Jan. 1955. At the time of his resignation from the U. P., Mr. Chaney was chief of the U. P. staff covering the House of Representatives at the nation's capital.

Stuart Colnon became president Oct 1 of Bell & Zoller Coal Co., Chicago, Ill., according to an announcement by Alfred M. Rogers, chairman of the board and chief executive officer prior to Mr. Colnon's association with Bell & Zoller. Mr. Rogers will continue as chairman of the board. In his new position, Mr. Colnon will head the merger of Bell & Zoller and Zeigler Coal & Coke Co. The new company will operate under the name of Bell & Zoller Coal Co. In taking his new position, Mr. Colnon resigns as president of Freeman Coal Mining Corp., a post he has held since 1947.

Frank Nugent is elected president, Freeman Coal Mining Corp., Chicago, succeeding Stuart Colnon, now president of Bell & Zoller. Mr. Nugent moves up to his new duties from a position as executive vice president. He started his career in 1919 with Freeman and remained with the company when it was acquired by Material Service Corp., an enterprise of Col. Henry Crown. Freeman is the 8th largest commercial coal-producing company in the U. S., with an annual output of approximately 7 million tons.

Donald D. Saxton has been appointed executive vice president and general manager of West Virginia Coals, Inc., Clarksburg, W. Va. He will supervise mining, marketing and preparation.

John L. Coleman has been appointed mine superintendent at Gorgas mine, Alabama Power Co.

Glenn E. DeRusha has been promoted to chief mining engineer of Northern Coal Mines, Republic Steel Corp., Uniontown, Pa., succeeding Joseph R. McVicker. A native of Apollo, Pa., Mr. DeRusha joined Republic in 1938. Prior to his new appointment, he was field engineer.

Obituaries

F. H. Morton, president of the Ames Mining Co., Charleston, W. Va., died August 27 after suffering a heart attack the previous evening. Funeral services were held at the First Presbyterian Church in Charleston with interment at Rainelle, W. Va.

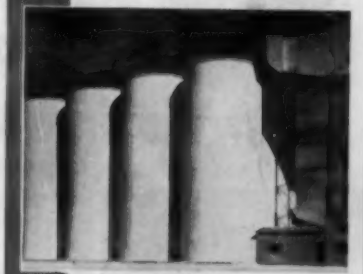
William H. Cooke, director of the Mid-West Coal Producers Institute, Inc., died August 28 after a brief illness. He was 53. Mr. Cooke was formerly vice president and director of the National Coal Association. During his career he was president of the Illinois Coal Strippers Association, the Pandora Coal Co. until its merger with Truax-Traer and the Little Sister Coal Corp. He was at one time a vice president of the Walter Bledsoe Co., and at the time of the Korean conflict Mr. Cooke served as chairman of the Coal Defense Committee.

Michael Gallagher, a director of the NCA for 17 yr and a NCA vice president for 3 yr, succumbed at the age of 87 to a heart attack on August 27. Mr. Gallagher had been active in the coal industry for half a century until his retirement this past June.

George S .Ward, 67, secretary of the Harlan County Coal Operators Association, Harlan, Ky., since 1926, died Sept. 21 at University Hospital, Knoxville, Tenn., of a heart ailment. Mr. Ward was one of the founders of now disbanded Kentucky Coal Association, and was active in industry affairs throughout the years. He was formerly sheriff of Harlan County and city treasurer of Harlan. Funeral was from the First Presbyterian Church, Harlan, Sept. 23.

Harry Luther Gandy, a prominent figure in the much-publicized Widen coal strike, passed away after suffering a heart attack at the age of 76 during the week of August 12. During the 1920's Mr. Gandy served as executive secretary of the National Coal Association, and in 1944 became assistant to the president of the

STOP material waste
REDUCE handling costs
IMPROVE product quality



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storage system

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Let Marietta design and erect an efficient and economical storage system for your needs. Marietta concrete silos are quickly constructed without weather or material delays. Precast solid or lightweight air-cell concrete staves interlock to form an air-tight wall that keeps material stored fresh and dry . . . safe from weather or fire damage.

Marietta concrete silos provide years of service with minimum maintenance . . . save money through reduced insurance costs.

Any type of mechanical or pneumatic conveyors, feeders or discharge systems can be safely mounted on top or on the sidewalls of Marietta silos. Consult with Marietta now for the best answer to your particular storage problems . . . benefit by their more than 40 years "Know-how" in precast concrete and industrial storage systems.

Write now for a copy of the Marietta Industrial Storage Systems Booklet. Full cooperation extended to your own engineering staff, consultants and contractors.

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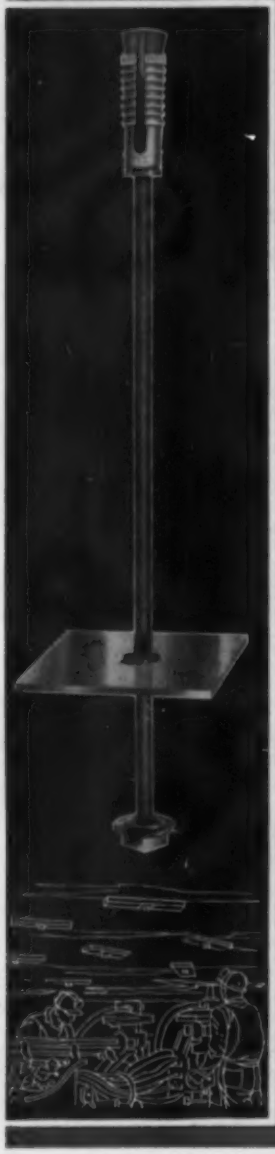

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	Yes	No
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Easy to Install?.....	☑	☐
Extra Gripping Power?.....	☑	☐
Uniform Quality?.....	☑	☐
Prompt Delivery?.....	☑	☐
Field Engineering Service?	☑	☐
Reliable Source?.....	☑	☐
Personalized Service?.....	☑	☐

For Safety, Quality and Service, it's West Virginia Mine Roof Bolts!

Contact West Virginia Works, Connors Steel Division, H. K. Porter Company, Inc., Huntington, West Virginia

H. K. PORTER COMPANY, INC.
CONNORS STEEL DIVISION

Obituaries *(Continued)*

Elk River Coal and Lumber Co. until poor health forced him to retire last year.

George W. Reed, former vice president of Peabody Coal Co. and a member of the first board of directors of NCA, died at his home in Chicago, Sept. 9, at the age of 79. Mr. Reed served on NCA's board from 1918 to 1921 and again from 1939 to 1948. He retired from Peabody Coal Co. in 1949. During World War I, Mr Reed was a member of the Coal Production Board.

Meetings

AIME, ASME, 20th Annual Joint Solid Fuels Conference, Oct. 10-11, Chateau Frontenac, Quebec, Que., Canada.

Illinois Mining Institute, Oct. 18, Abraham Lincoln Hotel, Springfield, Ill.

National Safety Council, 45th Annual Meeting, Oct. 21-25, Conrad Hilton Hotel, Chicago, Ill.

Kentucky Mining Institute, Annual Meeting, Oct. 31-Nov. 1, Phoenix Hotel, Lexington, Ky.

Petroleum Society, Mining Society, and Metals Society of the Pittsburgh Section, AIME, the Engineers' Society of Western Pennsylvania and the Pittsburgh Section of the National Open Hearth Committee; 12th Annual Off-The-Record Meeting, Nov. 1, Penn-Sheraton Hotel, Pittsburgh, Pa.

AIME, Annual Meeting, Hotel Statler and Hotel Sheraton-McAlpin, Feb. 16-20, New York, N. Y.

News Briefs *(Continued)*

made by the NCA of official reports made to the Federal Power Commission. The research showed that in areas where coal competed fully with oil and natural gas, the solid fuel demonstrated its superiority. Copies of the NCA study are available from Dr. M. E. Robinson, Director, Dept. of Coal Economics, National Coal Association, 803 Southern Bldg., Washington 5, D. C.

Plans for a $500,000,000 power project to be built on the shores of Lake Ontario in the Toronto-Hamilton area were recently revealed.

Two coal-fired generating stations, each with a 1.8 million-kw capacity will be, it is claimed, the largest in the world. Dockage facilities will be built to handle between 4 and 5 million tons of coal annually.

Tests being made in Germany reveal that it may be possible to convert coal to gas on a large commercial scale.

If so, large tonnages of anthracite coal

would be consumed in the process. Addressing his remarks to the 47th annual meeting of the N. Y. State Fuel Merchants Assn., Rep. Fenton (Pa.) spoke of the German experiments, saying, "there are good reasons to believe that the coal industry is on the doorstep of a new and brighter future."

Due to the increased coke production at Clairton Works, the need for producing beehive coke at Leisenring has been eliminated, and the No. 2 mine of U. S. Steel's Coal Div. will be closed down starting Oct 1.

Seventy-five men presently employed at the plant will be affected.

With the increased demand in the electrical industry for steam coal knocking at the door, Eastern Gas & Fuel Co. has authorized construction of a giant, 100% mechanized bituminous coal mine and cleaning plant to be built near Fairmont, W. Va.

Eastern Gas and Fuel, the fourth largest commercial producer of bituminous coal in the U. S., now operates three mines in Pennsylvania and 13 in West Virginia.

The ladies got in on the act in Mine No. 4 on Trout Run, Bigler, Pa.

An "open house" was staged by Ray S. Walker, owner of Bradford Coal Co., during which, the wives of the miners spent three hours riding the coal cars, observing coal production and loading methods, and best of all, watching their hubbies on the job. Later, there were refreshments and square dancing; a rare interlude in the mining routine.

U. S. Court of Appeals upheld the right of the Secretary of Labor to set minimum wages, for purposes of government contracts, for the bituminous industry.

The court ruled in litigation brought by Ruth Elkhorn Coals, Inc., and other non-union operators in Virginia, against an order of Secretary Mitchell fixing an hourly wage of $2.245 per hr. The secretary found this to be the prevailing wage for Pennsylvania, Michigan, Ohio, Maryland, West Virginia, Illinois and parts of Tennessee and Kentucky. It coincides with union rates. The non-union operators contended that the Walsh-Healy Act, which provides for minimum wages for workers producing on government contracts exceeding $10,000, does not apply to the soft-coal industry. But Judge Charles Fahy, speaking for the appellate court, said that "In all the circumstances of language, purpose and history (of the Walsh-Healy Act) the authority of the secretary to make determinations of the prevailing minimum wages for the bituminous coal industry must be upheld."

Certain railroads have asked the Interstate Commerce Commission to modify its order affecting permissive increases in lake cargo coal rates to lower lake ports.

They feel that there is pressure created due to the lesser increase now permitted

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PROBLEM: The Detroit Edison Company needed three separate conveyor systems to carry coal into their River Rouge power plant: (1) dock to storage, (2) dock to breakers to plant, (3) storage to breakers to plant.

SOLUTION: Quaker engineers and the Quaker distributor's men, working with engineers of the power plant, suggested the use of a belting designed for high lifts and long center distances. Over 7,000 feet was installed.

RESULT: The three conveyor systems work smoothly and efficiently, carrying coal into the plant at the rate of one million tons a year.

YOUR PROBLEM: Whatever your conveyor needs, whatever your industry—there's a Quaker Rubber Belt (or Hose) of the *right* construction to handle the job safely and economically. Quaker engineering service is available for the asking.

To make sure 7,000 feet of Quaker Rubber conveyor belting (available in 48", 60" and 72" widths) was properly installed, splicing and vulcanizing of the belting was supervised by a Quaker Rubber specialist.

For your free brochure on conveyor belting, write your nearby Quaker Rubber distributor, or:

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News Briefs

on lake cargo coal moving to the steel mills in the Chicago district and the larger increase applicable on lake cargo coal moving to the Buffalo area out of the same port. The original order of the ICC allowed increases of 8¢ per net ton rates to Lake Superior and Lake Michigan.

The first-aid team of Russelton mine, Republic Steel Corp., Russelton, Pa., won the 15th annual first-aid contest of the Allegheny-Kiski Safety and First-Aid Association at Springdale, Pa., Aug. 31.

Led by Captain Herman Schneider, the Russelton team achieved a score of 99.46 to win individual cash prizes of $60 and team trophies awarded by Mine Safety Appliances Co. and United Mine Workers. The Duquesne Light Co. team representing Harwick mine placed second with a score of 99.33, and Republic's Newfield mine was third with 98.73.

Senator Barrett (R-Wyo.) has protested any attempt to reduce the coal tonnage allocated Kemmerer Coal Co. for shipment to the atomic energy installation at Hanford, Wash.

The senator said the AEC had asked Kemmerer to give up 200,000 tons which would be shifted to Montana mines. Sen. Barrett said he had wired Lewis Strauss, AEC chairman, protesting the action and pointing out that southwestern Wyoming already has more unemployed miners than Montana employs.

Glenn Sorenson, president of the coal company, said the move "appears to be an effort to come up with a political solution to an economic situation at the expense of Kemmerer Coal Co. and southwestern Wyoming in general."

Kemmerer's 1958 contract calls for providing 476,000 tons to the Hanford plant. The company has shipped coal to the AEC installation since 1943.

Plans to sell Nugget Coal & Timber Co., Rock River, Wyo., have been announced by N. A. Swenson, president of the firm.

Included in the sale will be a strip coal mine at Hanna, Wyo., two uranium leases, a sawmill and planing mill at Rock River and 20 million ft of stumpage to be harvested.

A bill which would increase the acreage of public coal lands which could be leased by a single firm has been shelved by Congress.

The move will cause at least an 8-mo delay in the construction of a $3-million coal-carbonization pilot plant at Rock Springs, Wyo., planned by Union Pacific Coal Co. and Husky Oil Co., according to J. B. Wilson, president, Wyoming Natural Resources Board. The measure would permit railroads to mine coal along right-of-way for purposes other than locomotive fuel, and would increase the maximum acreage a firm can lease from 5,120 acres to 20,480 acres. It was planned that char from the Rock Springs

(*Continued on p 158*)

At Steep Rock Lake, Ontario, dredge pumps lined with Lukens "T-1" steel (321 min. Brinell) remove two million cu. yds. per month.

Rock, Gravel Crash Through World's Most Powerful Dredges; Lukens "T-1" Steel Adds 33% to Liner Life!

TRADEMARK

Dewatering of this Canadian lake by Caland Ore Company, Ltd., will permit open-pit mining of hematite ore.

In dredging operations, impact and abrasion combine with brutal force to give pump liners expensive beatings. In the world's most powerful dredges, Lukens "T-1" steel now slashes this expense for Construction Aggregates Corp., agents for Caland Ore Co., Ltd.

With order after order, Lukens "T-1" steel is lasting 33% longer than the abrasion resistant steel formerly used.

Whether you handle stone, coal, or metal ores, Lukens "T-1" steel used in the areas hardest hit by punishing abrasive impact will save you money, too. It has tripled the life of rock driers. The 321 minimum Brinell quality has been known to outlast previous metals by 18 to 1 in quarry wear plates. Chutes, hoppers, and mine cars are other typical applications.

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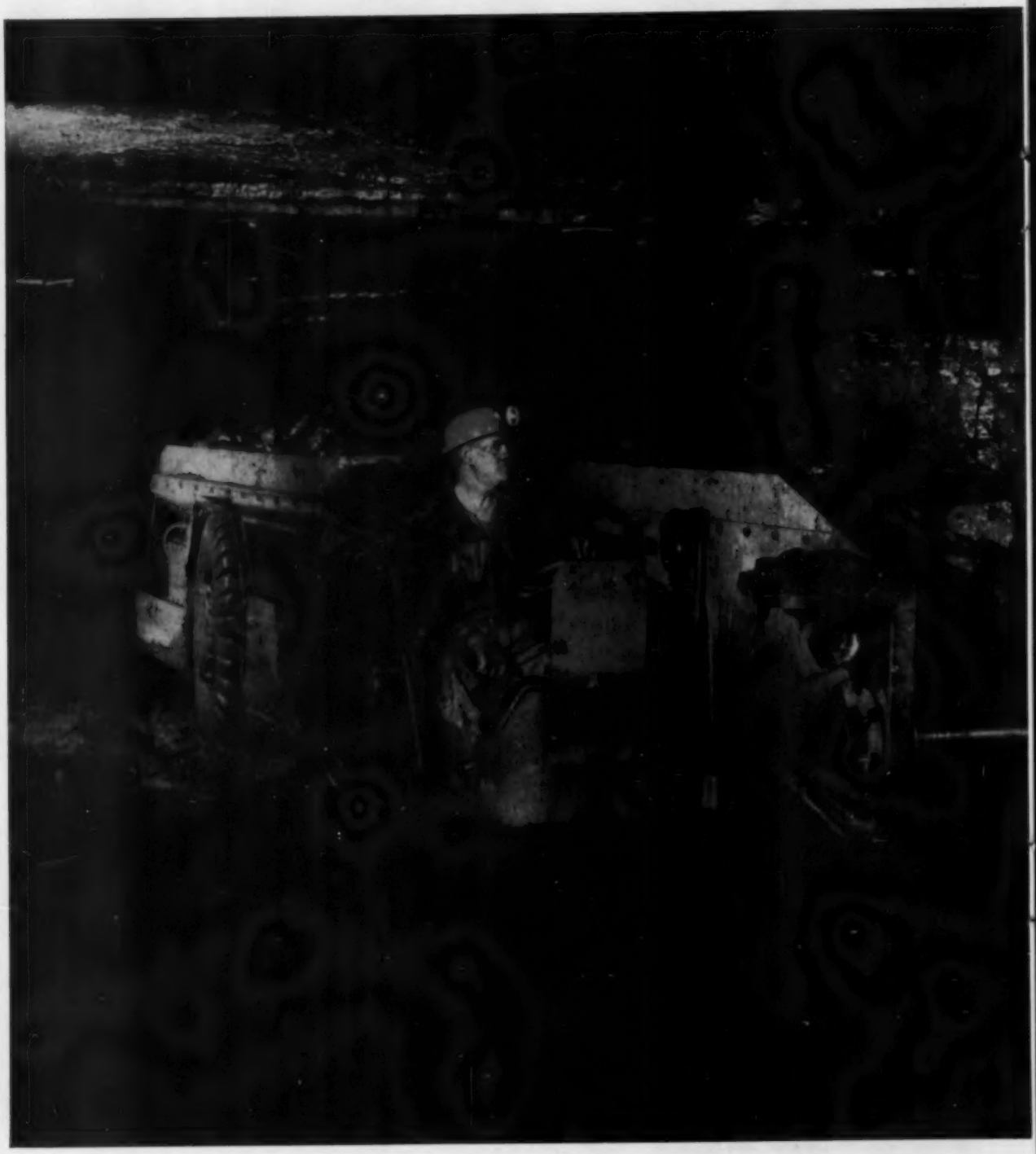

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National Mine Service Company's "TorKar" powered by a Westinghouse type SK motor sets new standard for shuttle car operation

New performance and maintenance standards have been established by this modern shuttle car design in over four years of actual field tests. A single ac or dc motor supplies all required power for the machine, with a torque converter for protection against overload.

The Westinghouse Type SK motor on this unit is a flange-mounted, totally enclosed fan cooled, Bureau of Mines-Approved, Explosion-proof type, with the extra stamina required to meet rugged mine requirements. Westinghouse design provides for better commutation, longer bearing life, and easy access to commutator and brushes.

Get all the facts about Westinghouse mining motors, both standard and special, by calling your Westinghouse sales engineer. Or write Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-22051

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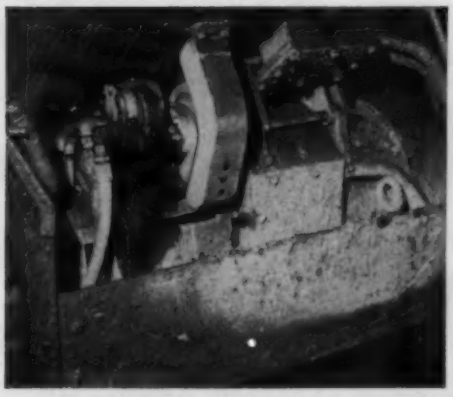

It's easy to see this motor isn't pampered. Dirty, dusty, damp conditions have not been able to stop this 25 hp Westinghouse Type SK motor from delivering its full rated capacity as the single power source for National Mine Service Company's "TorKar."

Briquetting Today and Tomorrow

International Association considers present position and future outlook for all types of briquetting.

A FUTURE of continued decline in the domestic consumption of coal briquets was foreseen at the 5th biennial conference of the International Briquetting Association, Glenwood Springs, Colo., Aug. 19-21. However, participants in the conference expect continued growth in the use of briquets and pellets incorporating coal in industry.

In addition to technical papers covering most of the aspects of briquetting today in the United States and abroad, the association adopted four standards for conducting abrasion, compression, specific gravity and weight-per-cubic-foot tests. These standards were developed by a committee headed by J. M. Moore, C. Reiss Coal Co. Ashland, Wis. Other members were: Edward Prostel, Wyoming Natural Resources Research Institute; N. Berkowitz, Research Council of Alberta; W. S. Landers, U. S. Bureau of Mines; C. W. Link, Berwind Fuel Co., R. W. McAllister, Arthur D. Little Co.; E. Swartzman, Canadian Dept. of Mines & Technical Surveys; and W. A. Vanderland, Canadian Pacific Ry.

Officers and members of the executive committee for the next biennium were chosen as follows:

President—C. W. Link, manager, Briquet Div., Berwind Fuel Co., Superior, Wis. Mr. Link succeeded H. C. Richter, Stott Briquet Co., St. Paul, Minn.

Vice-President—J. M. Moore, C. Reiss Coal Co, Ashland, Wis.

Secretary-Treasurer (re-elected)—Neal Rice, Natural Resources Research Institute, University of Wyoming, Laramie, Wyo.

Executive Committee—In addition to the officers, Paul D. Haigh, Komarek-Greaves & Co.; L. C. Krchma, Socony-Mobil Oil Co.; Mr. Swartzman; L. J. Erck, The Cleveland Cliffs Iron Co.; Dr. H. J. Rose, Bituminous Coal Research, Inc.; Mr. McAllister; T. F. Jones, Berwind Fuel Co.; Mr. Landers; R. W. Lattig, Westvaco Mineral Products Div., Food Machinery & Chemical Corp.; John I. Mayer Jr., United Coal & Dock Co.; A F. Olson, Cliff Dow Co.; Mr. Richter; and L. A. Woodward, Dakota Briquets & Tar Products, Inc.

Session chairmen were: Mr. Richter; Joy A. McIntosh, Johnson Coal Cubing Co.; and Mr. Link. Mr. Haigh was toastmaster at the banquet, at which the speaker was H. T. Person, dean of engineering, University of Wyoming. His topic was "The Colorado River Story."

Chemical Briquetting

Briquetting topics scheduled for the technical sessions were:

"The Position of Briquetting in the Chemical Industry," R. W. McAllister, Arthur D. Little Co., Cambridge, Mass. One of the best opportunities for the growth of briquetting in the chemical industries lies in putting the reactants in one package—for example, coal, iron ore and limestone—to speed up the operation. Gasification of coal and lignite also are receiving greater consideration in several industries as a result of steadily using natural-gas prices. The techniques vary, but most processes call

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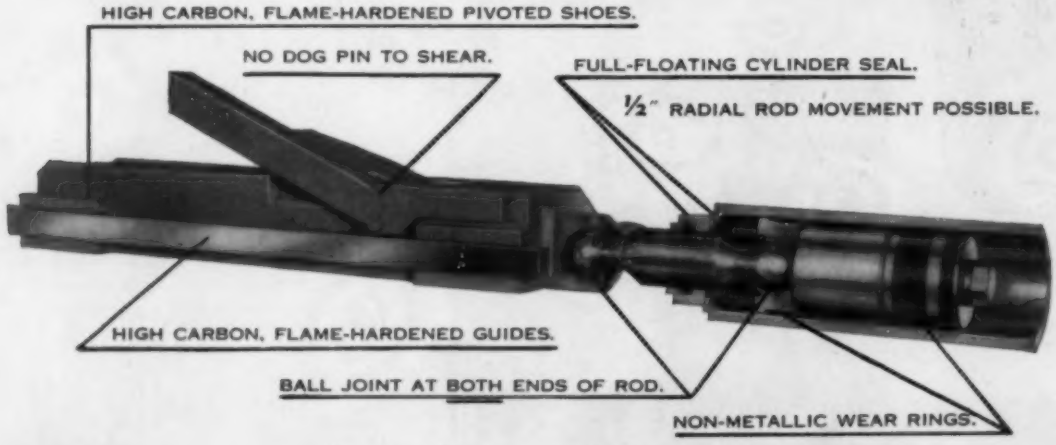
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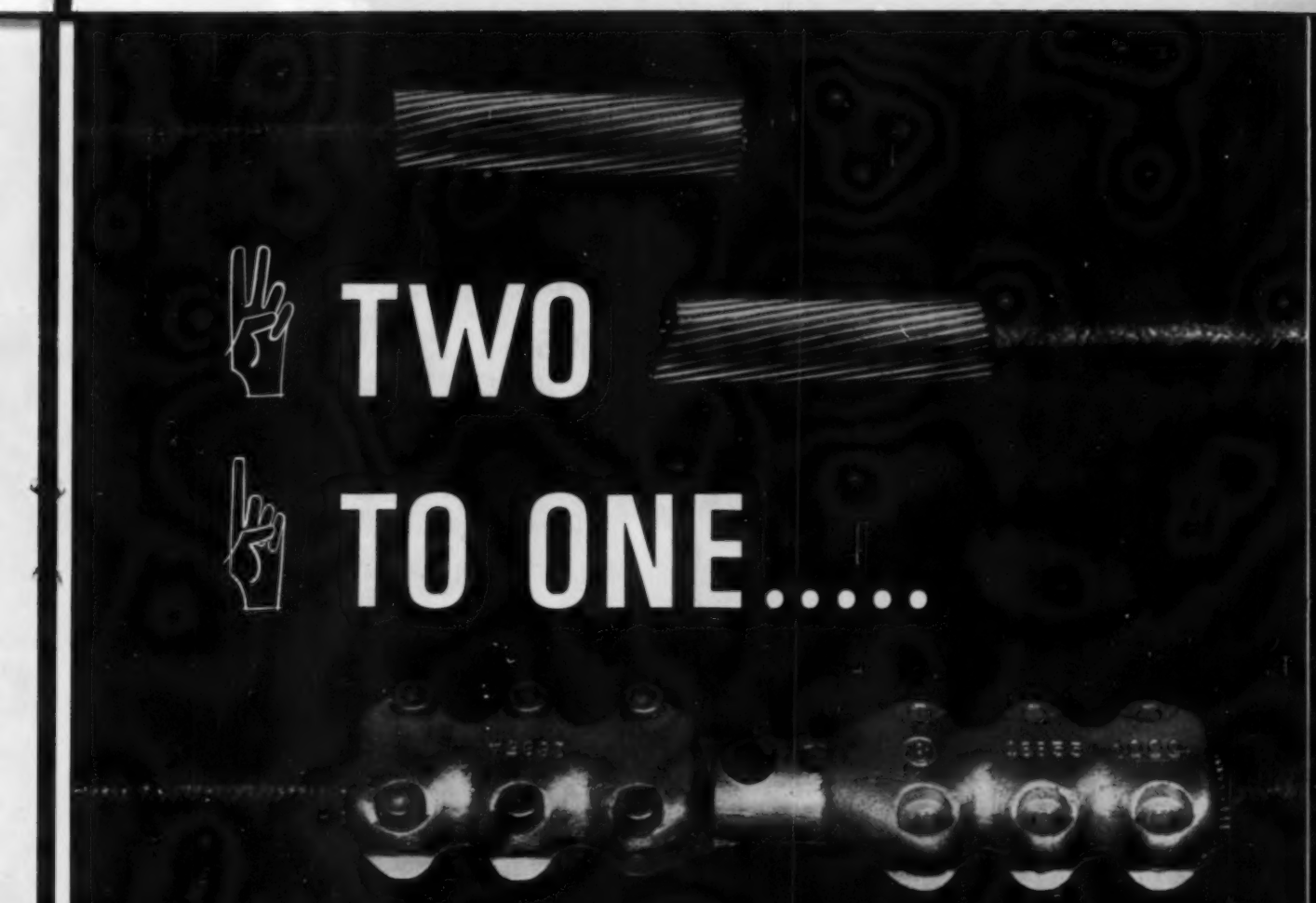

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The 516 MT has long been a favorite with coal miners. It can raise 5½ tons as much as 9½ inches, is only 16 inches high when closed and has the famous oblong rack bar for greater strength and dependability.

A ratchet jack such as the Duff-Norton all-purpose 516 MT is no stronger than its rack bar—the notched steel bar which moves up and down supporting the load. The forged-steel rack bar on this five-ton capacity mining jack is stronger than the rack bar on any other make. *It's stronger because it's larger.*

Even a brief examination of the jack will confirm the truth of this statement, for the bar on Duff-Norton jacks is oblong, while that of other makes is square.

Ask your distributor for information on Duff-Norton coal mining jacks—there is a Duff-Norton jack for every pulling, pushing or lifting job in the mines. Or, write the world's oldest and largest manufacturer of lifting jacks for a copy of AD-10-J, "A Handy Guide for Selecting Duff-Norton Mine Jacks."

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Briquetting *(Continued)*

for uniformly rigid particles, which briquetting can help provide.

"Briquetting Phosphate Rock," Edward Prostel, Wyoming Natural Resources Institute.

"Briquetting Mix Properties," V. Lerentz, John Fisher and L. C. Krchma, Asphalt Sales, Socony-Mobil Oil Co., Kansas City (read by Mr. Krchma). Density of the mix probably is the most critical factor observed by the authors in discussing the need for additional work on mix properties as a means of improving briquet quality and the capacity of briquetting equipment.

"High-Pressure Binderless Briquets," K. Ruckstuhl, Pawert, Inc., Basel, Switzerland (read by Mr. Landers)—Design features, applications and advantages of the Glomera press.

"Smokless Briquets for Domestic Use," Ritsuji Kada, Fuel Society of Japan, and Nobuyuki Kita, Japanese National Rys.

"Briquetting With Emulsion Binder," Hidetoshi Matsunami, Shinagawa Fuel Co., Japan. Both the preceding papers were presented by Mr. Rice. Messrs. Kada and Kita noted that consumption of briquets had dropped somewhat compared to prewar and cited as their major problem the obtaining of coal from abroad—primarily anthracite—to serve as the raw material.

Anthracite Agglomeration

"Laboratory-Scale Experiments in the Production of an Agglomerated Anthracite Metallurgical Fuel," J. W. Eckerd and W. S. Sanner, U. S. Bureau of Mines, Schuylkill Haven, Pa. (read by Mr. Sanner). One major need in putting anthracite into position to compete for a place in pig- and foundry-iron production is improving its physical characteristics to withstand the handling and burdens encountered in blast-furnace and cupola operations. Using any of several types of binders, with or without the addition of 10% bituminous coal, and subsequently heat-treating the briquets, the laboratory experiments indicate that this upgrading of physical characteristics is relatively easily achieved.

"What Faces the Briquetting Industry," Mr. Haigh and panel members as follows: J. M. Ehrhorn, U. S. Smelting, Refining & Mining Co., Salt Lake City; Mr. McIntosh and Dr. J. Visman, Canadian Dept. of Mines & Technical Surveys. In addition to other conclusions the panel forecast a continued decline in the use of briquets for home heating and, in Canada, for commercial and industrial purposes also. In the United States, the briquetting of coal and iron was seen as a possibility, as well as the briquetting of coal, charcoal, coke and petroleum coke with other materials—sawdust, for example—for various applications.

"Charcoal Briquetting," B. D. Smith, Black Panther Co., Sanford, N. C.

"The Use of Starches as Briquetting Binders," John Dumond, Illinois Cereal Mills, Paris, Ill.

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You're looking at one of the smoothest coal-handling layouts in all of West Virginia's mining country. A long and heavily-laden trip is being pushed through a diamond turnout into a rotary car dumper. There, one after another, the cars will be dumped without uncoupling and returned underground—all within a matter of minutes.

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Current Coal Patents

By Oliver S. North

Crawler shaker conveyor, E. R. Bergmann (assigned to Goodman Mfg. Co., Chicago, Ill.), Sept. 10, 1957. Improved shaker conveyor loader wherein a mobile drive unit for the conveyor trough line serves also to advance and transport the apparatus around the mine. While loading, the device is securely anchored by hydraulic jacks, No. 2,805,751.

Articulated conveyors, J. R. Madeira, R. F. Lo Presti and R. F. Boersma (assigned to Goodman Mfg. Co., Chicago, Ill.), Sept. 10, 1957. Design for an articulated propelled conveyor capable of negotiating very short radius turns while tracking in a sinuous path with an advancing or retracting continuous miner. No. 2,805,758.

Tandem conveyor, C. F. H. von Stroh and H. J. Thomas (assigned to Bituminous Coal Research, Inc., Washington, D. C.), Sept. 10, 1957. Tandem system for conveying coal wherein the individual units used can be readily interlocked together and driven by a single power source. Advantages are flexibility, portability and ease of interconnection of units. No. 2,805,760.

Surge car apparatus, G. F. H. von Stroh and H. J. Thomas (assigned to Bituminous Coal Research, Inc., Washington, D. C.), Sept. 10, 1957. Design for an improved self-propelled surge car apparatus adequate to handle the fluctuations in output from a continuous mining machine. The apparatus will load out shuttle cars intermittently as required without interfering with operation of the mining machine. The mechanism is constructed especially for use where coal seams are of low height. No. 2,805,761.

Belt conveyor supported upon spaced flexible strands, R. A. McCallum (assigned to Goodman Mfg. Co., Chicago, Ill.), Sept. 10, 1957. An improved support for the flexible strands of a rope frame conveyor. The support can shift in accordance with changes in length of strands as determined by the amount of tension placed thereon. No. 2,805,763.

Pneumatic material handling system and apparatus, J. I. Yellott (assigned to Bituminous Coal Research, Inc., Washington, D. C.), Sept. 10, 1957. In a system for aerial conveyance of pulverized bulk solids such as coal, air-pervious false bottoms used in pneumatic conveyors are replaced by air-pervious mattresses, tubes, or other hollow members made of woven fabric. Air is fed to the members in pulsating flow, and the overlying mass of material is repeatedly broken up and caused to flow towards the discharge opening. Nos. 2,805,896 and 2,805,897.

Froth flotation process, D. I. H. Jacobs (assigned to The Distillers Company Ltd., Edinburgh, Scotland), Aug. 20, 1957. An aliphatic monocarboxylic acid diester is an efficient frother for coals and sulfide and non-sulfide ores. Relatively limited amounts of this reagent are required, and a fairly stiff, non-weeping froth is produced. Need for addition of froth-stiffening substances is obviated. Conventional flotation methods are used. No. 2,803,345.

Mine roof support systems, M. C. Potts (assigned to Dowty Mining Equipment Ltd., Tewkesbury, England), Aug. 20, 1957. Improved roof support system for use in coal mines being mined by longwall methods. Individual hydraulic support beams can be quickly set up behind newly cut faces. Collapse of roof behind supports can be effectively controlled. No. 2,803,444.

Process for the production of carbon monoxide from a solid fuel, C. G. Ludeman (assigned to Texaco Development Corp., New York, N. Y.), Aug. 20, 1957. Efficient method for generating carbon monoxide and hydrogen by reaction of powdered coal with oxygen and steam. The improvement consists of passing gases upwardly through the bed at sufficient velocity to fluidize the minus 150-mesh coal particles but not the larger particles. The fines are seperated and ignited with oxygen to produce the carbon monoxide and hydrogen. No. 2,803,530.

Method of heat treatment, separation, and coking coal, F. W. Jung, Aug. 20, 1957. Process for separating high or low vitrain coals from non-vitrain coals. The coal is crushed, heated in an inert atmosphere to a temperature at which the vitrain begins to soften and expand, and agitated to prevent agglomeration. The mixture is cooled, if necessary, and separated by gravity methods. The expanded vitrain particles may be burned to supply heat to the apparatus or they may be used in compounding the coking mixture. No. 2,803,587.

Process for separating by size and specific gravity solid materials in suspension in a fluid, J. Turpin (assigned to Preparation Industrielle des Combustibles, Fontainebleau, France), Aug. 27, 1957. Process for separating, concentrating, and classifying coal in fluid suspension. The coal is mixed with finely-ground magnetite and centrifuged. No. 2,804,206.

Vibrating screen, A. van Hardefeld and F. M. van Tillo (assigned to Stamicarbon N. V., Heerlen, Netherlands), Aug. 27, 1957. Design for a vibrating screen apparatus particularly suitable for screening coal fines. No. 2,804,208.

Mine transfer cars, W. Whaley, Aug.

Latest Stoper Drill Development Simplifies Roof Bolting in Low Coal

Le Roi-Cleveland S-20 Vac-Nu-Matic stoper, with new feed principle, is only practical machine in seams from 36" down to 26". Other sizes available for any seam height.

28-inch feed S-20 weighs only 65 pounds. It is the lightest dust-collecting type stoper available—operators say it's easier to use.

The revolutionary S-20 stoper is designed especially to provide a better way of producing roof-bolt holes.

Low coal or high coal makes no difference to this machine. It lets you put your roof-bolts wherever you need them — even in 26-inch coal. And high drilling speed along with light weight and a positive dust-collection system helps your miners get the work done faster.

New feed principle provides low overall height and longer travel. The S-20's feed consists of an air piston combined with a chain in such a way that the travel of the machine is double the travel of the feed piston. As a result, it drills a deeper hole with one steel change than a standard stoper does with two changes.

Because it does away with at least one steel change and in some cases two, this longer travel saves roof-bolting time.

The low overall height is obtained because the S-20 is the only stoper that starts its feed at the bottom of the machine. The starting height, regardless of feed length, is always 16½ inches.

Dust collection is instantaneous. There are no hoods or tubes to handle or adjust, when your miners use the S-20 Stoper. The cuttings and dust are pulled through the drill steel instantaneously and ejected through the side of the chuck housing into the dust box—no cuttings go through the machine itself.

There's complete absence of dust because the S-20 system pulls a high vacuum. It uses only 18 cu. ft. of air at 80 lbs. pressure to pull a static vacuum of 16½ inches of mercury or a fluid vacuum of 13 inches while the machine is running. Wet top presents no problem.

New design speeds roof-bolting operation. The S-20 has been in the field for more than a year, working in all types of coal mines. According to the evidence piled up during this period, S-20 users not only roof-bolt areas heretofore impossible to get at — they also do the work faster.

Features that contribute to this increase in efficiency are: Lighter weight. Low overall height. Longer feed. Positive dust-collection. Fast drilling speed.

Test the S-20 in your mine. See how it reduces roof-bolting costs. A demonstration can be arranged by contacting Schroeder Brothers, 3116 Penn Ave., Pittsburgh, Pa.; Acme Machinery Co., Williamson, West Virginia; Equipment Service Co., Inc., 617 North 9th St., Birmingham, Alabama. Or, you can contact us direct.

LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Cleveland air tools, Tractair, portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

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BBC — Balanced Belt Construction equalizes ply stress — every ply pulls its full share of the load! BOSTON'S exclusive manufacturing methods eliminate "lazy" plies which put extra strain on other plies and cause premature rupture and belt failure.

BBC is the result of two advanced BOSTON processes: *Electro-Tensile Control,* which electronically controls ply tension; and *Rotocure* the only continuous method of vulcanization, which assures uniformity throughout the belt.

With Balanced Belt Construction, BOSTON belts set entirely new standards of longer, trouble-free service and greater economy.

***BOSTON FLAMEOUT BELTS OFFER MAXIMUM UNDERGROUND FIRE RESISTANCE!**

(United States Bureau of Mines Designation No. 28-9)

BOSTON BOSTON WOVEN HOSE & RUBBER CO. BOSTON 3, MASSACHUSETTS

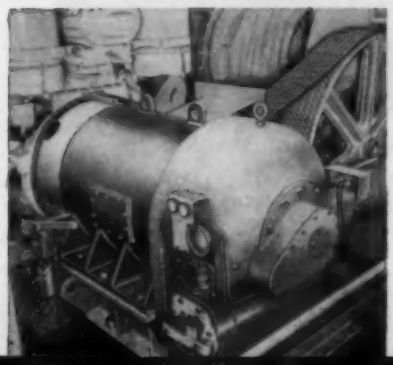
LIMA Type 2400 with Torque Converter moves overburden faster at lower cost

The torque converter, standard equipment on all LIMA Type 2400 machines, is another of the quality features that enable LIMAS to outperform and outlast ordinary machines. It automatically increases torque as required by the load, making higher output possible by avoiding stalling and making performance much smoother and faster.

For assignments calling for an electrically-powered 6-yard machine, the LIMA Type 2400 is available with complete electrical power package. Combining a single AC electric motor with a single stage torque converter, this drive matches, *electrically*, diesel-torque converter performance. You get maximum power performance under all operating conditions . . . and the motor won't stall or burn out.

Cable life is increased and machinery maintenance reduced because shock loading is minimized as the oil in the converter cushions any sudden blow. Friction clutches last much longer because the torque converter reduces friction clutch slippage during acceleration.

LIMA quality design and construction extras make for profitable, efficient operations with minimum downtime. There's a LIMA type and size for every job—shovels ½ to 6 cu. yds., cranes to 110 tons and draglines variable. Smaller capacities are available on rubber. For full details, contact your nearby LIMA distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.



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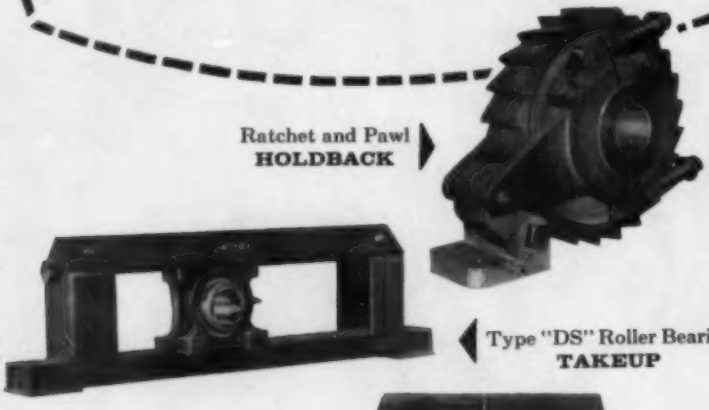
BALDWIN-LIMA-HAMILTON

Construction Equipment Division—LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation • Hamilton • Loewy-Hydropress • Madsen • Pelton • Standard Steel Works

Continental
Belt Conveyor ACCESSORIES



Ratchet and Pawl **HOLDBACK**

Type "DS" Roller Bearing **TAKEUP**

Automatic Gravity **TAKEUP**

Idlers of all types and sizes

Precision built to highest standards for dependability and economy of operation. Stocked for immediate shipment—*call, wire or write your nearest Continental office.*

CG-5719

INDUSTRIAL DIVISION
CONTINENTAL GIN COMPANY
BIRMINGHAM, ALABAMA

CGC ATLANTA CLEVELAND DALLAS KNOXVILLE MEMPHIS MOBILE NEW YORK 17

Patents *(Continued)*

27, 1957. Improved construction for crawler-type transfer cars to be used in connection with loading mechanisms in coal mines. Hydraulic control is provided. No. 2,804,220.

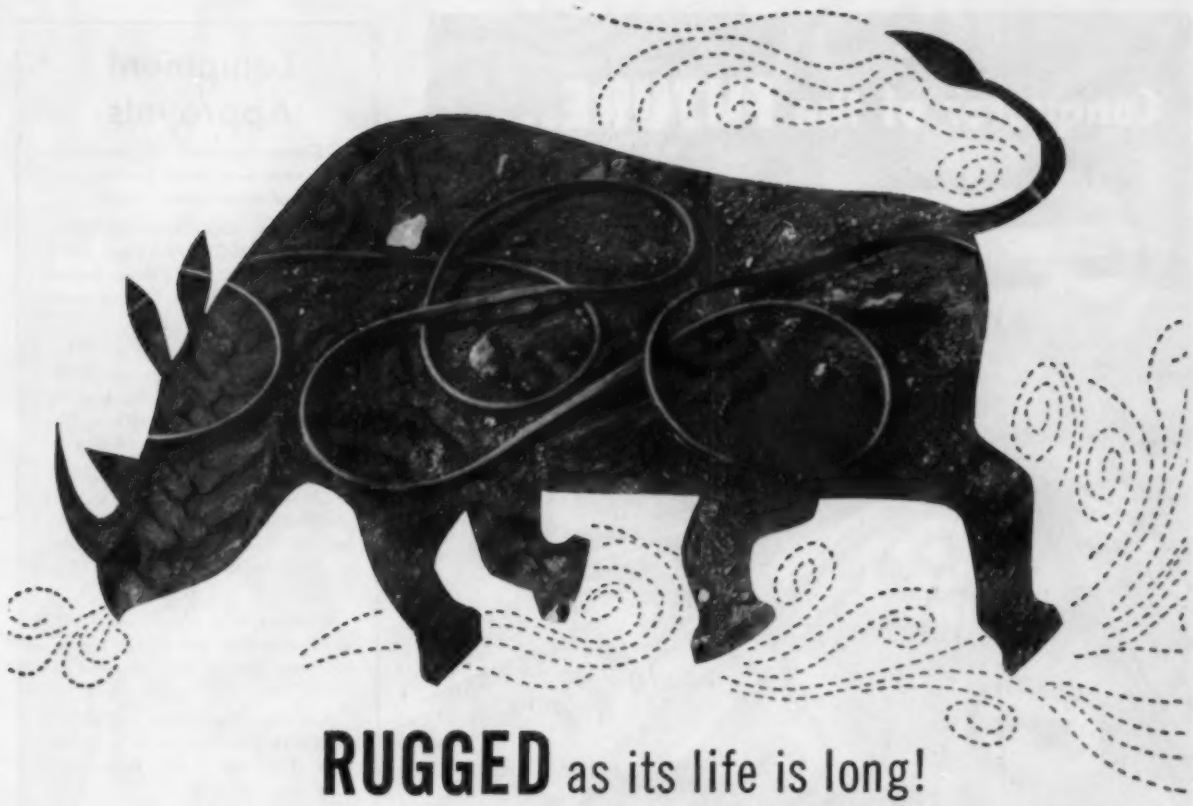
Tubular, pronged reinforcing member for rock strata, L. M. Seely (assigned to Super-Grip Anchor Bolt Co., Inc., Philadelphia, Pa.), Sept. 3, 1957. Improved anchor structure which engages the walls of the hole in the rock strata at numerous points along the length of the anchor, so that slippage or tearing loose of the anchor is substantially prevented. The tubular bolt has laterally expansible tooth portions along its entire length, and suitable expander means within the axis of the tube for forcing the toothed portions outward. No. 2,804,797.

Process for producing synthesis gas and coke, M. Joseuhans (assigned to Koppers Co., Inc., a corporation of Del.), Sept. 3, 1957. Improved "dust gasification" process and apparatus for producing fuel or synthesis gases. The coke used as fuel or feed material is produced from coal simultaneously with production of the gases. Greater output and improved fuel efficiency are obtained. No. 2,805,188.

Method of heating and fluidizing for a carbonization process, E. O. Williams (assigned to Standard Oil Co., Chicago, Ill.), Sept. 3, 1957. Improvements in methods of processing finely divided coal while it is in liquid or gaseous suspension, in such operations as carbonization, complete gasification, hydrogenation and liquefaction, or production of feed gases for hydrocarbon synthesis. Swelling and stickiness are eliminated by contacting the coal with oxygen or an oxygen-containing gas. No. 2,805,189.

Coal Men on the Job . . .

PEABODY COAL CO., Mine No. 17, Pana, Ill.—Tony Shimkus, superintendent.



RUGGED as its life is long!
ROEBLING PARALLEL TWIN MINING MACHINE CABLE

Ground conductor is braided and eased into shape from fine annealed copper wire for outstanding resistance to flexing fatigue and tensile stress.

GR-S insulation around each power conductor is heat- and moisture-resistant.

Ground conductor has braided green cotton covering. It strips clean for easy terminating, splicing.

This economical, extra-flexible cable is available as Type G, with ground wire, or Type W, without.

Sheath surrounds and grips conductor insulation... conductors are locked fast, can't "sleeve."

Sheath is tough, oil- and moisture-resistant, flame-retardant Roeprene®.

Complies with requirements of U.S. Bureau of Mines for flame-resistance and carries Bureau of Mines symbol P-111-BM. Write Electrical Wire Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for complete information.

ROEBLING

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Subsidiary of The Colorado Fuel and Iron Corporation

MORRIS meets the CHALLENGE of INDUSTRY'S NEW FRONTIERS

No Matter What Your Present or Future Heavy Pumping Problems Are . . . Morris Can Satisfy You NOW!

The new Morris Type RX Slurry Pump is specifically engineered to handle the viscosities, densities and special characteristics of the slurries and sludges developing from industry's ever-advancing products. It is engineering attuned to the future . . . designed to meet the demands of a towering tomorrow.

Rugged, Dependable, Trouble-Free; Operates With Minimum Attention . . . Cuts Maintenance Costs!

The new Morris RX is designed for performance perfection under all conditions, including heavy, coarse, fine slurries, dispersions and sludges. Operates at low speeds; quickly dismantled for inspection, avoiding lengthy lay-up time.

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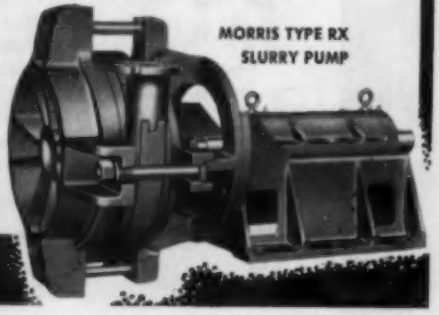
FREE SERVICE: Morris engineers will gladly recommend the custom-made pump best suited to your needs. Send necessary data today.

MORRIS TYPE RX SLURRY PUMP



MORRIS CENTRIFUGAL PUMPS

Equipment Approvals

Thirteen approvals of permissible equipment were issued by the U. S. Bureau of Mines during August.

Joy Mfg. Co.—Types 6SC7BPE-3, 6SC7BPF-3, 6SC7BPXE-3, and 6SC7-BPXF-3 shuttle cars; three motors, each 10 hp, 250/500 v, DC. Approvals 2-1274/2-1274A, Aug. 2.

Joy Mfg. Co.—Types 6SC3PE-5, 6SC3PF-5, 6SC3PXE-5, and 6SC3PXF-5 shuttle cars; three motors, two 7½ hp and one 10 hp, 250/500 v, DC. Approvals 2-1275/2-1275A, Aug. 5.

Joy Mfg. Co.—Types 6SC7PE-3, 6SC7PF-3, and 6SC7PXE-3, and 6SC7PXF-3 shuttle cars; three motors, two 7½ hp and one 10 hp, 250/500 v, DC. Approvals 2-1276/2-1276A, Aug. 6.

Goodman Mfg. Co.—Style 820399 distribution box; one circuit breaker, 600 amp, 440 v, AC. Approval 2-1277A, Aug. 15.

Joy Mfg. Co.—Types 9SC2BPE-5, 9SC2BPXE-5 shuttle cars; three motors, each 15 hp, 250 v, DC. Approval 2-1278, Aug. 22.

Tennessee Coal & Iron Co.—Roof bolting machine; four motors, three 7½ hp and one 50 hp, 250 v, DC. Approval 2-1279, Aug. 27.

Island Creek Coal Co.—Utility car; one motor, 2 hp, 250 v. DC. Approval 2-1280, Aug. 27.

The Schroeder Brothers Corp.—Electric shaft shovel; one motor, 40 hp, 440 v, AC. Approval 2-1281A, Aug. 28.

Galis Electric & Machine Co.—Type EP-1 post puller; two motors, one 35 hp and one 10 hp, 250 v, DC. Approval 2-1282, Aug. 29.

Bright Star Industries—Model MX-212 A/U flashlight. Approval 622, Aug. 19.

H. Rost & Co.—Acceptance designation 28-19 to cover "Balatros" 4-ply, 31-ounce, impregnated rayon carcass, PVC conveyor belt.

Plastic Wire & Cable Corp.—Symbol 124-BM was extended to include a flat, twin No. 2 Type G cable as flame and damage resistant.

News Briefs *(Continued)*

plant would provide fuel for a steam-electric plant to power development of iron-ore deposits in Wyoming.

St. Clair Coal Co., after 62 yr of continuous operation, will close on Oct. 15.

"Queen" with a KING-SIZE BITE!

Here's the 140-ft. tall "River Queen", digging into overburden with its 55-cu. yd. dipper . . . seconds later reaching high and wide with its 145-ft. boom and 86-ft. dipper handle to spoil 80 tons of earth and rock 300 feet from the digging point.

This big 1650-B shovel — with its custom-built long range front end — is uncovering two seams of bituminous coal in a single continuous operation. It is leading the way to economical coal recovery for its owners.

In every detail of its design, this electric powered stripper maintains the finest Bucyrus-Erie tradition: providing the necessary range, capacity, speed, and reliability for consistently high output at low operating cost. In addition, its unique flexibility offers a wide range of dipper capacities and boom and handle lengths, making it possible to select the most suitable digging combination for your specific needs.

Truly, here is a "queen" with a king-size bite — from 40 to 65 cubic yards! For your stripping problems, select from a complete line of stripping shovels and walking draglines from 2½ to 65-cu. yd. capacities. Bucyrus-Erie Company, South Milwaukee, Wisconsin.

135L57

BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

needed... 4,000 tons of coal a day...

and New York Central's coal fleet gets it there on time for Public Service of New Jersey

New Bergen Generating Station of Public Service of New Jersey has been designed for coal—will require 4,000 tons a day when installation is completed.

Dependable service to the nearly 1½ million electric customers of Public Service of New Jersey will be greatly augmented and enhanced by completion of its ultramodern Bergen Generating Station. This new generating station is located for prompt delivery of coal by New York Central's coal fleet.

At full load, the Bergen Generating Station, which has been designed for coal, will require 4,000 tons of bituminous coal a day to deliver 3,800,000 pounds of steam per hour. New York Central's fleet of nearly 41,000 coal cars—including more than 5,000 new 70-ton hoppers—is ready today, to take this important, new requirement for coal in stride, as well as the additional coal requirements of a number of other electric utility plants served by the New York Central which are presently adding generating units to their plants.

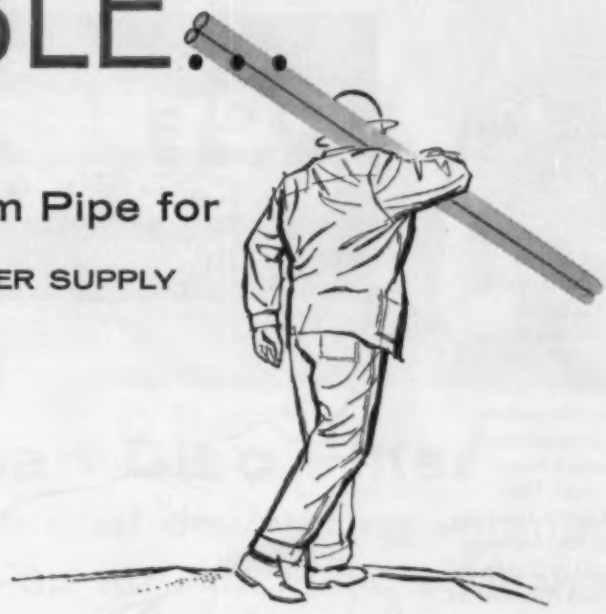
Rapid, efficient transportation and handling of coal have been an important objective of New York Central's long-range expansion program. For this fall's coal stocking program, for any shipment requirements you may have—now or in the future—depend on New York Central for prompt delivery.

For help in meeting your particular coal requirements or in solving your coal-burning problems, write or contact Coal Sales Managers of the New York Central Railroad. They are conveniently located in Chicago, Cincinnati, Cleveland, Detroit, New York and Pittsburgh.

New York Central Railroad

Route of the "EARLY BIRDS"—the one-day faster freight service

PORTABLE ECONOMICAL DURABLE...



Alcoa Aluminum Pipe for

TEMPORARY WATER SUPPLY
OR DRAINAGE
COMPRESSED AIR
STEAM . . . FUEL

Portable piping plays a major role in keeping mining operations on the move. Here's why it will pay you to specify light, strong ALCOA® Aluminum pipe for your portable piping needs:

PORTABLE . . . One man can easily handle several standard lengths of ALCOA Aluminum pipe. Small crews can quickly and easily lay long lines of pipe. Pick-up and relaying is just as easily accomplished to keep pace with moving jobs.

ECONOMICAL . . . Quick, easy handling by small crews means low laying costs. And extra long service life adds extra savings.

DURABLE . . . Rugged ALCOA Aluminum pipe stands up under heavy abuse when laid or strung from supports over or under the roughest terrain. And aluminum is highly resistant to corrosion under the most severe conditions.

Operating efficiency of ALCOA Aluminum pipe is excellent. It has the same friction factor as smooth drawn tube of other metals, insures low loss of head.

ALCOA Aluminum pipe and quick couplings of aluminum are immediately available—through a nationwide network of distributors. You'll find them listed under "Pipe" in the Yellow Pages of your telephone directory. Check your distributor for a complete list of sizes available . . . or use the handy coupon.

NEW! "ALCOA THEATRE" Exciting Adventure Alternate Monday Evenings

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Name the wrench you want and chances are Proto's got it. Big ones, little ones—box, open-end, combination. All precision-made from extra tough alloy steel. Use them! Send 10 cents for big tool catalog. Proto, 2210 Santa Fe Ave., Los Angeles 54.

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PROTO means PROfessional TOols
DIVISION OF

Coal Men on the Job . . .

CLINCHFIELD COAL CO., Compass No. 3 mine, Dola, W. Va.—T. D. Moore (left), safety director; Paul Stewart, mechanical engineer.

News Briefs *(Continued)*

according to Mrs. Jessie E. Smyth, president of the company.

Approximately 200 men will lose their jobs. Present value of a preparation plant on the property is reported to be $570,092.

The SS Coal Miner will haul grain instead of coal to Europe on its next trip.

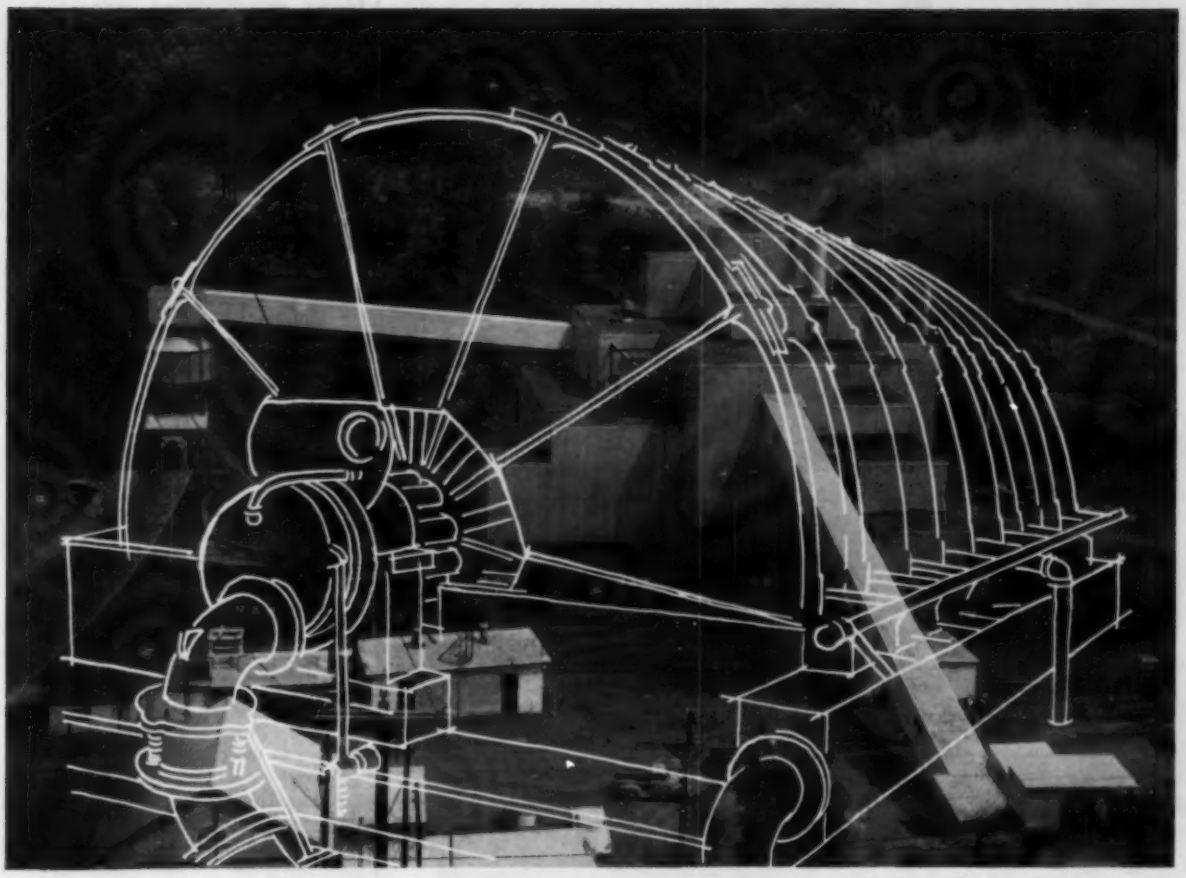
The Norfolk office of American Coal Shipping, Inc., confirmed last month the first ship acquired by ACS is carrying a cargo of corn, bound for Trieste. An ACS spokesman pointed out that many ship operators are withdrawing ships from the coal trade. The "going rate" for trans-atlantic coal hauling now is slightly above $4 per ton, contrasted to rates of about $11 a ton a year ago. Some German and Belgian importers are considering using dry-cargo vessels to store coal during the fall and winter, which might alleviate the losses to ship owners planning to lay up ships because of the low coal rates.

The Board of Directors, National Coal Association, meeting at White Sulphur Springs, W. Va., Sept. 18, adopted a budget for the fiscal year beginning Oct. 1.

The budget provides for acceleration of operations of NCA, Bituminous Coal Institute and Fuels Research Council. The board also voted unanimously to continue membership dues at 7½ mils per ton of production. The board accepted the resignation of John L. Kemmerer as NCA treasurer, and named George E. Enos, president Enos Coal Mining Co., Cleveland, to fill out Mr. Kemmerer's term. Class A members of the BCI board of directors were named as follows: B. R. Gebhart, T. L. Kelce, Ralph H. Knode and M. L. Patton.

The Louisville & Nashville railroad has proposed reduced rates on fine-coal shipments to Tampa, Fla.

Coal shipments from mines on L&N's lines in Kentucky and Tennessee would have rates from $1.65 to $2.06 per net



American Disc Filter

provides positive coal dewatering without circuit fines build-up at Clinchfield's Moss #2

Dante, Va. — At Clinchfield Coal Company's Moss #2 Mine this 10'-6" dia. by 10 disc American Filter installed in the coal cleaning plant is providing positive fine coal dewatering of thickener underflow.

Designed to handle 100 mesh x 0 material containing 72% minus 200-mesh at 35 to 40% solids, the unit will recover 38 tph of fine coal. In addition to providing a filter station which insures exceptionally high capacity per unit area with high solids retention value, the American Disc also delivers a filtrate acceptable for return to the washery system *without build-up of fines.*

Simply stated, the American Disc Type Filter, when applied to a washery discharge clarification and recovery problem, is the best bet yet from both sides of the picture — product recovery and filtrate clarity.

If you have a problem in the recovery of fine coal, chances are a D-O Engineer can be of help to you; or if you would like descriptive literature, write Dorr-Oliver Incorporated, Stamford, Conn.

American T. M. Reg. U. S. Pat. Off.

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WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
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Power shovel of Hanna Coal Company, Division of Pittsburgh Consolidation Coal Company, at work in its Georgetown No. 12 open-cut mine.

On the Mighty Mountaineer...

HUNDREDS OF FEET OF AEROQUIP HOSE LINES USED FOR AUTOMATIC LUBRICATION OF CRAWLERS

Wayne Fuhr, chief lubrication engineer, checks Aeroquip Hose Lines on the automatic crawler lubrication system of the world's largest mobile unit.

To provide lubrication of the eight giant crawlers on which the Mountaineer moves, Hanna engineers designed an automatic system using dependable Aeroquip Hose Lines. In addition to giving long service, Aeroquip can be replaced quickly, when necessary, right in the field. Call your Aeroquip Distributor listed in the Yellow Page Phone Book or write us for full information on this quick replacement idea.

Aeroquip

REG. TRADEMARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN

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AEROQUIP (CANADA) LTD., TORONTO 10, ONTARIO
AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

News Briefs *(Continued)*

ton under the present rates. Proposed rates to Tampa are: From Windrock group, $4.55; LaFollette group, $4.61; Jellico-Middlesboro group, $4.66; Harlan group, $4.77, and West Kentucky, $4.94.

Consumers Public Power District, Columbus, Neb., will construct and operate a nuclear power plant at Hallam, Neb., according to an AEC announcement.

Under terms of a contract with AEC, a sodium-cooled, graphite-moderated reactor, designed to produce 75,000 kw, will be built. The power district will provide the site and a turbine generator, will contribute $5,220,000 toward the cost of the nuclear section of the plant and will operate the facility for 5 yr. Estimated cost of the nuclear section is $29,000,000. Research and development work will be done by North American Aviation Co.

Pitt-Consol, world's biggest commercial producer of coal, is taking steps to improve neighborhood relations, in its area of operations.

The company has announced a program of selling supporting pillars to owners of surface property who elect to have this support. The firm has offered to sell the pillars on a time-payment basis. The coal will then be left in place under the homes or buildings of subscribers to the plan.

National Maritime Union, contending with Seafarers International Union for jurisdiction in representing employees of American Coal Shipping, Inc., want a prompt representation election among seamen employed by the company.

In a letter to the National Relations Board, NMU charges the Seafarers with "fraudulent practices" in providing certificates of service to individual seamen on ACS ships which were later invalidated by the Coast Guard.

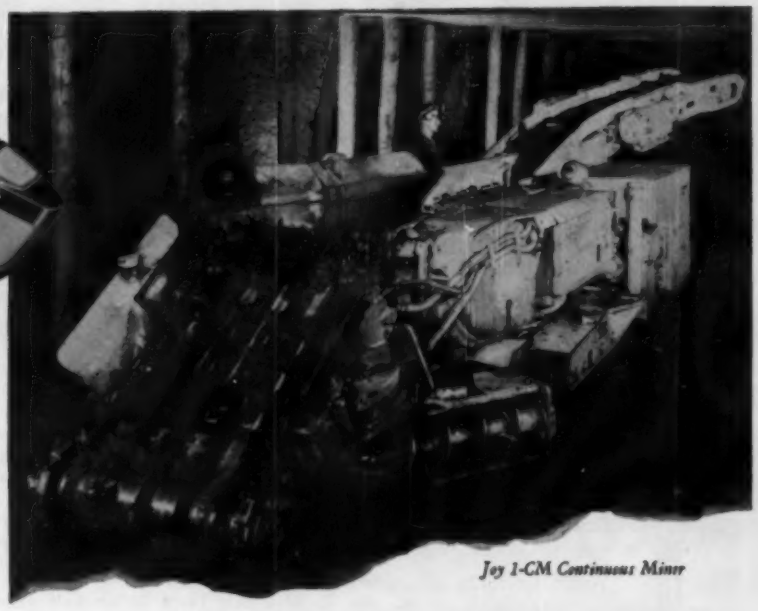
Coal Men on the Job . . .

CLINCHFIELD COAL CO., Compass No. 3, mine, Dola, W. Va.—Jack Light (left), safety director; Ben Tudor, mining engineer, and Chester Stull, section foreman.

Specify PERFORMANCE-PROVED

CARMET MINING MACHINE BITS

FOR YOUR EQUIPMENT



Joy 1-CM Continuous Miner

From the many styles of Carmet cutter bits, there's one best suited to your particular conditions and the mining equipment you use. Carmet bits are proven performers in every mining area in the country, in all types of coal seams, even under the most adverse cutting conditions.

Extra-strong alloy steel shanks, specially designed to give greater support to the cutting tip, allow the use of a superior, more wear resistant grade of carbide. As a result, tool bit life is greatly extended for economy of operation and greater profit to you.

Your Carmet distributor will be glad to work with you in setting up a practical tooling program that will not only mean added production but, at the same time, will reduce your maintenance costs. Call him *today* for help in your mining tool selection. ***Allegheny Ludlum Steel Corporation, Carmet Division, Detroit 20, Mich.***

CARMET DISTRIBUTORS

Brace-Mueller-Huntley, Inc.
Offices: Buffalo, Rochester & Syracuse, N.Y.
Carbon Transfer & Supply Co., Helper, Utah
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Consolidated Supply Co., Picher, Oklahoma
Crandall Engineering Co., Inc., Birmingham, Ala.
Drillmaster Supply & Mfg. Co., Evansville, Ind.
Gladstein Co., McAlester, Oklahoma
Leechburg Supply Co., Leechburg, Pa.
Marion Mine & Mill Supply Co., Whitewell, Tenn.
McCombs Supply Co., Jellico, Tennessee
Oglebay, Norton Mine Supply Div.,
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Persinger's Inc., Charleston, W. Va.
Union Supply Co., Denver, Colorado
U. S. Steel Supply Co., Pittsburgh, Pa.
W. B. Thompson Co., Iron Mountain, Michigan

Write for your copy of the CARMET MINING TOOL CATALOG and METHODS MANUAL

Illustrates full line of Carmet mining bits . . . giving tool dimensions, rake and clearance angles, etc. Specifies grinding wheels and procedures for reconditioning tool bits.

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The Original DOUBLE-BONDED Carbide Bit

CARMET®

WSW 6609

the pump they couldn't clog!

It was a hydropulper application, handling 500 GPM of 5% stock at 50′ TDH. Among the things that sometimes entered the line were rubber gloves, baling wire, and even a tablecloth! A 6" Wemco torque flow Solids Pump passed them all and asked for more!

Write for more information on this amazing pump and its "can't-clog" *liquid impeller action.*

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Foreign News

GREAT BRITAIN

Atom Plant Contract

Britain has contracted with English Electric, Babcock & Wilcox, and Taylor Woodrow to build the 500-mw atomic power station at Hinkley Point, Somerset. Scheduled for completion by the end of 1962, the power station will cost $168 million.

Although the Hinkley Point station is the largest nuclear power station so far ordered in the world, it is not likely to keep this distinction long. The next two nuclear power stations—due for contracting in March, 1958—will probably be even larger. These may have generating capacities up to 800 mw.

Hinkley Point will produce electricity which would otherwise have to be generated by buying 1.5 million tons of coal a year.

Fire-Resistant Belt

One of Britain's latest responses to the Creswell mine disaster of 1950, in which fumes from a burning belt caused the deaths of 80 miners, is the development of conveyor belting made of terylene polyester fibers by Rubber Improvement, Ltd., and Imperial Chemical Industries. Soon after the disaster, Rubber Improvement produced a PVC-coated belt using 6-ply cotton reinforcement. Although the belt was fire-resistant, it was heavy and tended to slip on pulleys and driving surfaces.

Collaborating on a better belt since 1955, Rubber Improvement and ICI have produced one of three plies of Terylene-reinforced fabric coated with PVC. ICI says the new belt, at half the thickness of a 6-ply cotton belt, is just as strong and lighter, more flexible and still flame resistant. Its lighter weight makes it more desirable for use on movable face conveyors, and troughing is reported to be excellent. Low-stretch and low moisture-absorption properties of terylene prevent the belt from changes in length with changes in humidity.

BULGARIA

Higher Production

The first 7 mo of 1957 ended with a 9% surplus production for all coal qualities combined, i.e., 568,900 metric tons of coal were produced above and beyond the planned level. By year's end, planning authorities are shooting for a total output of 11 million metric tons. By comparison, production was 10.4 million tons in 1955 (*Coal Age*, November, 1956, p 83).

Bulgaria's native production is reported more than adequate to meet state and private demands although usage has involved heavy dependence on inferior quality coals. Out of the total 1955 output mentioned above, 10.2 million metric tons consisted of brown coals and lignites. COM-ECON rulings require that Bulgaria export its better grades to fellow satellite countries.

In a constant effort to improve production, planning authorities continue to stress the introduction of new mining methods and better machinery. Special attention is being paid to open pit mines. During 1957, more than 43% of all coal mined will come from open pits. In 1960, plans call for open pits to supply roughly two-thirds of total production.

PAKISTAN

Import Needs

The Pakistani Government hopes to import one million tons of coal a year from Wankie Colliery in Southern Rhodesia, according to Mohammad Akron, Pakistan trade commissioner for the Federation of Rhodesia and Nyasaland. Akron said Pakistan is today importing coal from Red China and from "anywhere else that can supply it." He added that Pakistan, until recently, was importing two million tons of coal a year from South Africa which is now short of railway trucks.

Pakistan's million-ton order with Wankie Colliery is firm but, at present, the Rhodesia Railway system lacks trucks to carry the coal to the coast for shipment to Pakistan. Recently, the first coal ever to be exported from Southern Rhodesia—6,000 tons for the government of Sudan—was shipped from Lourenco Marques in Portuguese East Africa.

JAPAN

New Heavy Media

Litharge and rubber in 0.028-in cubes have been tested at Miike colliery in Japan in heavy-media separation processes, reportedly with excellent results. The litharge and rubber are mixed to a specific gravity of 3.7, then mixed with water to a specific gravity of 1.4. Two pilot plants for 10 and 30 tph worked satisfactorily. These were followed by two plants for 70 tph, one for 1.6x0.87-in coal and the other for 3x1.6-in. Media recovery consists of separating litharge and rubber in a settling tank.

Consumption of the material after 18 months of testing was 0.65 oz per ton of raw coal. This low consumption, reduced wear and tear on piping and pumps and reduced space requirements are said to make the method economical, in spite of the higher price of the material.

FRANCE

ECSC Chief Resigns

Rene Mayer of France, president of the six-nation European Coal & Steel

Lignite stripping operation of the Knife River Coal Mining Company, Bismarck, North Dakota, where the exclusive use of dependable, fast-moving Macks really keeps the shovel-runners hustling.

200,000 miles with routine maintenance and repair...

...is what Knife River Coal is getting from the Macks used in their lignite mining operation. Mr. A. S. Kane, Assistant Vice President, says:

"These units haul 20 tons 3½ miles from mine to plant...reaching a top speed of 45 miles per hour. In this short-haul, high-speed operation it's imperative that we obtain a high degree of efficiency. Our Macks give us just that...and then some.

"Winter and summer our Macks keep going... maintaining really tight schedules with no more than routine maintenance and service. Many of these dumpers have clocked over 200,000 miles. Yet, we have had no major repair bills for any of them."

Find out how Mack stamina and earning power can pay off on your operation. Your local Mack representative can show you other Mack operators getting the same matchless performance, no matter what the job. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

MACK
first name for
TRUCKS

SUTPHEN'S WOOD PIPE FOR MINE SERVICE

Sutphen machine-made wood pipe is recommended for all types of mine service. It is particularly endorsed for drainage lines.

PETER O. SUTPHEN WOOD PIPE showing Tenon and Socket Joints which drive tight and swell tighter after saturation.

WOODS USED: California red wood, clear, all heart stock—rot resistant and termite resistant. White pine. Hard pine. Special hard wood—for flushing culm and other abrasive materials. Wood pipe is not affected by electrolysis.

SIZES: Made in sizes from 3 in. up to and including 24 in. for pressures up to 172 lb. per sq. in. Pipe lengths up to 12 ft. Shorter lengths can be furnished to lay around curves without fittings. (Sutphen wood pipe carries 14% more water than metal pipe due to less friction.)

JOINT FITTINGS: Fittings can be supplied for connections to either wood or metal pipe.

COST OF LAYING: Much less than for cast-iron pipe. No special labor or material needed in making joints. Its lightness permits easy laying.

PETER O. SUTPHEN

(Est. 1945)

SUCCESSOR TO A. WYCOFF & SON COMPANY (EST. 1855)

Underground and Exposed Wood Water Pipe

Box 58 Everett, Pa. Phone 39

Foreign News *(Continued)*

Community's High Authority, announced his resignation effective Oct. 15. The former French Premier said he would continue to act in his official capacity until his successor has been chosen. M. Mayer was named president of the authority in June 1955. He replaced Jean Monnet of France at the head of the pool for coal and steel products from France, Belgium, Italy, Luxembourg, The Netherlands and West Germany.

AUSTRALIA

Portable Elevator

An Australian-designed portable elevator features a lightweight, low-cost frame and does not depend upon weight to give it stability. In conventional types, it is usually necessary to have considerable overhang to project over the stack when the elevator is lifting material to a substantial height. This overhang limits stability when the unit is being transported.

The Australian design features an extensible frame to which the elevator is connected in such a manner that when the frame is extended the elevator is in lowered position, but as the frame is retracted the elevator is raised, thus providing the overhang only when it is needed.

One end of the elevator is pivoted at one end of the extensible frame. A jackleg is pivoted at the other end of the frame and at the center of the elevator. Shortening or extending the frame causes the jackleg to raise or lower the elevator.

The frame is made of telescoping members which are run in and out by a winch or by a hydraulic system. The unit has been patented.

USSR

Soviet Industry in 1960

The USSR is planning to produce in 1960 593 million tons of coal, compared with 395 million tons in 1955, and 68 million tons of steel, against 45 million in 1955. According to Soviet News, published in London, the economy of the USSR is growing at a rate of from five to seven times faster than that of capitalist countries, estimated from percentage annual increases in output.

These increases for the period 1930-1955 are given as follows:

USSR	12.3%
United States	3.3%
Great Britain	2.4%
France	0.9%

Other sources report that France is due to receive 600,000 tons of Russian coal by June, 1958, but is now embarrassed by the Soviet decision to send only one quarter of this through Baltic ports and the other three quarters through Black Sea ports, instead of the other way around, as was the previous practice. Shipment of Don-basin coal from the Baltic lowers rail costs.

16 years of abrasion, oil, weather —and 4000-foot neoprene belt system keeps rolling

There's a clue to real profit for coal mine operators in the experience of the United Illuminating Company of Bridgeport, Connecticut. This utility has been using the same 4000 feet of neoprene belting for *16 years*. The three belts in the system have already hauled hundreds of thousands of tons of *oil-sprayed* coal, and they're ready for many more years of service.

Neoprene offers outstanding resistance to practically any deteriorating conditions above ground or in underground service. Rugged neoprene resists deterioration by constant exposure to oil and grease which softens and weakens ordinary rubber. It stands up to sunlight, weather, the abrasive action of coal and rock. It shrugs off acid water. In addition, neoprene contributes to safety because it's fire-resistant—will not support combustion.

Next time you replace your conveyor belting or buy a new conveyor, be sure to specify neoprene. Its *balanced combination* of properties will save you money. We would like to tell you more about neoprene and its many useful properties. A request will put your name on our mailing list for regular, free copies of the Elastomers Notebook. Just write: E. I. du Pont de Nemours & Co. (Inc.), Elastomer Chemicals Department CO-10, Wilmington 98, Delaware.

DU PONT

Better Things for Better Living
. . . through Chemistry

NEOPRENE
made by Du Pont for 25 years

Management Picnic, Stonega Coke & Coal

FEATURE of the picnic for 233 mine officials and department heads of Stonega at Lonesome Pine Country Club, Big Stone Gap, Va., Aug. 24, was presentation of Joseph A. Holmes Certificates of Honor to the company for having operated with no fatalities from Oct. 30, 1953 to Dec. 31, 1956, and continuing, while producing 3,478,558 tons in 2,291,163 man-hr of exposure; and to Roda Colliery at Roda, Va., for producing 1,276,906 tons in 1,635,238 man-hr during the same period. Awards were presented by J. S. Malesky, district supervisor, U. S. Bureau of Mines, Norton, Va.

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WITH THE NEW IMPROVED

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MODEL CD-51-57

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- Augers Rotated by Vickers 21.5 H.P. Fluid Motor with Hydraulic Feed Finger Tip Controlled
- Cutting Shield And Guide Completely Automatic
- Drill Powered By 65 H.P. Water Cooled Motor.

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"THE PARIS DRILL IS THE BEST WE HAVE EVER USED."

SEND FOR COMPLETE DETAILS

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New Books

Management Personnel

Selection of Management Personnel, edited by M. Joseph Dooher and Elizabeth Marting, is the American Management Association's new two-volume handbook on new selection techniques. This comprehensive reference work covers the entire selection process and uses a general approach that is applicable to technical, sales, accounting and other specialized personnel. Included are descriptions of the manager's job, the qualities necessary for success in business and industry; and the methods by which managers are chosen and evaluated. Over 40 leading management experts discuss practical aspects of executive and supervisory selection. A special feature of the book is a group of 19 detailed case histories of actual company practices in management selection. *Two volumes, boxed. 892 pp. 6¾x9¾-in; cloth. $15, AMA members $10, American Management Association, 1515 Broadway, Times Square, New York 36, N. Y.*

Materials Handling

Materials Handling Equipment, by D. Oliphant Haynes. This volume presents the story of materials handling machines and systems, what they do and how they do it. Major sections include transporting equipment, elevating equipment, conveying equipment, transferring equipment, self-loading equipment, and bulk-handling equipment. *636 pp plus 2,200 illustrations. $17.50, Chilton Book Division, 56th and Chestnut Sts., Phila. 39, Pa.*

Industrial Water

Industrial Water and Industrial Waste Water is a symposium developed by the ASTM Committee on Industrial Water. Major topics discussed include industrial waste, water pollution, sea water purification and use of flocculating agents to treat industrial waste and industrial waste water. *52 pp. 6x9-in; cloth. $2, American Society for Testing Materials, 1916 Race St., Phila. 3, Pa.*

Wire Rope

Wire Rope Manual is a complete reference guide on the care and use of wire rope and slings. Some of the major

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Bolting crews spend less time installing and wrenching bolts — have more time for drilling holes — when they use O-B expansion Shells and Plugs!

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This speedy installation leaves more time for drilling — means faster bolting, less exposure to unsupported roof, and an added measure of safety for bolting crew and all production workers.

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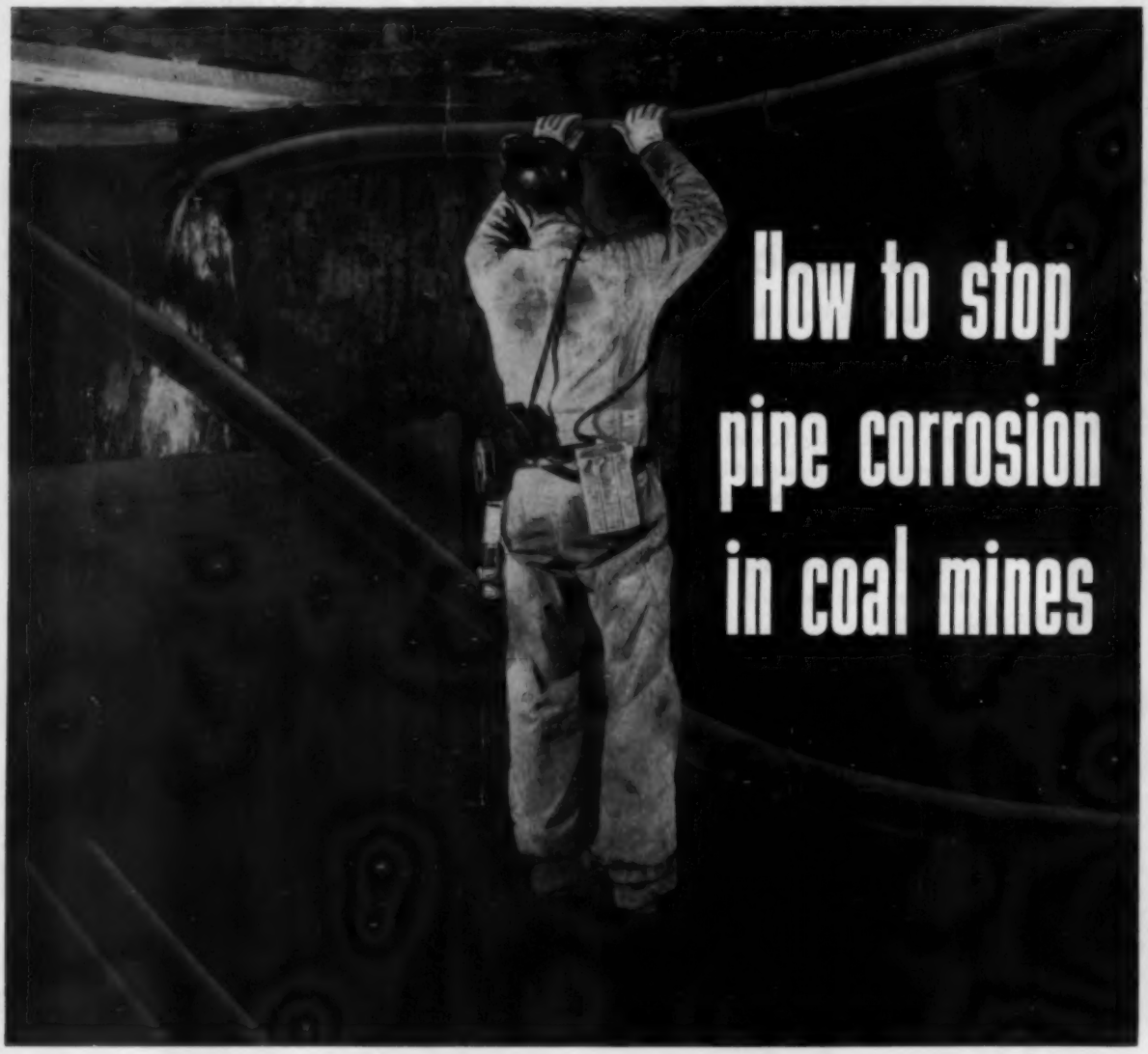

How to stop pipe corrosion in coal mines

Simple. Use USS NATIONAL* Polyethylene Pipe. Mine water has no effect on it. Acids, alkalis, salts and most chemicals are helpless against its tough, inert composition. So, you install it once and forget about it.

Tough and flexible

NATIONAL Polyethylene Pipe won't crack from rough handling, even at low temperatures. And it remains rugged and flexible over its entire working range from −90°F. to +120°F.

Light and workable

A coil of NATIONAL Polyethylene Pipe can be carried on the shoulder. It unrolls like hose, turns corners, goes over or under obstructions. Easily joined with insert-type fittings, secured with stainless steel clamps. All types of fittings available for any layout.

Manufactured from pure 100% "on grade" polyethylene raw material, USS NATIONAL Polyethylene Pipe is available in sizes from ½ inch to 6 inches in diameter, in a variety of wall thicknesses. For full details, write to National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

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NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH 30, PA
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

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UNITED STATES STEEL

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• Build better customer relations
• Speed car turn-around

Order Sterling Rock Salt now—regular or "Inhibium Treated" for maximum protection against corrosion of metal equipment. Available in bulk or handy 100-lb. bags from International's strategically located mines.

. . . treat your coal shipments with Sterling Rock Salt

It takes so little time and effort to apply Sterling Rock Salt! Just two to four bags of this effective antifreeze agent will keep an entire carload of coal from freezing. Sterling Rock Salt can be quickly applied, handles easily, is harmless to hands and clothing. It dissolves slowly, to give long-lasting antifreeze action. *Your customers will gladly pay the small premium for coal they can unload without first having to thaw it out.*

You can also use Sterling Rock Salt to prevent frozen scales and switches . . . and to keep roads and yards clear throughout the winter. It removes snow and ice *fast*.

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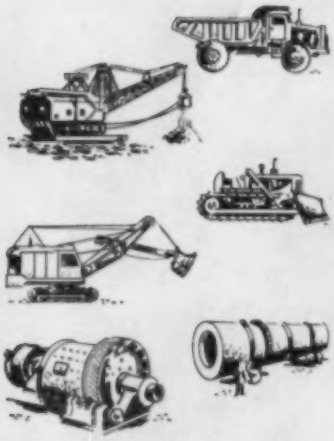

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THE TREND toward super power and super capacity in machinery calls for SUPER RESISTORS to keep breakdowns at a minimum.

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New Books (*Continued*)

topics are inspection of wire rope, methods of lubrication, use and abuse of wire rope, and sheave maintenance. *Manual G-16 5x6¾-in. Free to engineers, superintendents and purchasing agents, Macwhyte Company, 2908 14th Ave., Kenosha, Wisconsin.*

Human Relations

Human Understanding in Industry, by Dr. W. C. Menninger and Dr. Harry Levinson. This handbook, written especially for supervisors, is designed to help them understand and solve the types of personnel problems that beset leaders in industry today. The material is organized so that it can be used for supervisor training courses such as conducted by many larger companies. A Leader's Guide, for use in conducting discussion groups, also is available. *Single copies, $2.25; 25 or more, $1.75 each; Leader's Guide, $.50, one copy free with each 10 copies of book; Science Research Associates, 57 W. Grand Ave., Chicago 10, Ill.*

Mine Drainage

Recommended Practice for Drainage of Coal Mines is a revision of the work published by the American Standards Association under the sponsorship of the American Mining Congress in 1931. The text of the earlier edition has been enlarged to give more detailed information on the nature of acidic mine water and on metals and alloys that have been tested for relative resistance to corrosion and erosion from such waters. *USBM Bulletin 570. 18 pp. 8x10¾-in; paper. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.*

Alaska Reserves

Investigation of Subbituminous Coal Beds Near Houston, Westward Extremity of Matanuska Coal Field, Alaska, by R. R. May and R. S. Warfield. This report, R. I. 5350, presents findings based upon a USBM drilling project in Alaska. The field contains approximately 15 million tons of fuel in two beds. *R. I. 5350, Publications Distribution Section, U. S. Bureau of Mines, 4800 Forbes St., Pittsburgh 13, Pa.*

Strippable Illinois Reserves

Strippable Coal Reserves of Illinois, by William H. Smith. This booklet surveys Illinois seams 18 in or more in thickness with overburden not exceeding 150 ft, in Gallatin, Pope, Hardin, Johnson, Saline and Williamson Counties. The report discusses stripping possibilities and salient geologic features of 17 beds in these southeastern Illinois counties. Maps show outcrops, mined-out areas, thickness of coal and isopach lines dividing overburden into categories of thickness in 50-ft increments, 0-50, 50-100 and 100-150. *Illinois State Geological Survey Circular 228. 39 pp; map, and columnar sections. 6¾ x 9¾; paper. Urbana, Ill.*

"CF&I Space Screens provide 100% grading uniformity to within 1/16"..."

reports Mr. Henry T. de Holl, Chief Engineer of the Philadelphia Coke Company, Philadelphia, Pennsylvania. "Since our complete change-over to CF&I Space Screens, we have worry-free assurance that our customers will get the exact dimensions they ordered," he adds. The company produces about 475,000 tons of coke per year; uses 18 different sized CF&I Space Screens in grading coke sizes ranging from 3/16" to 6".

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an important feature in the Flash Drying of Fine Coal

The prime function of the Dedusting Unit is to remove the maximum amount of dust from the dried coal and burn the ultra-fines in a furnace to supply the heat for drying.

This provides a simple and effective method of handling two troublesome problems:

1. Vent loss to atmosphere
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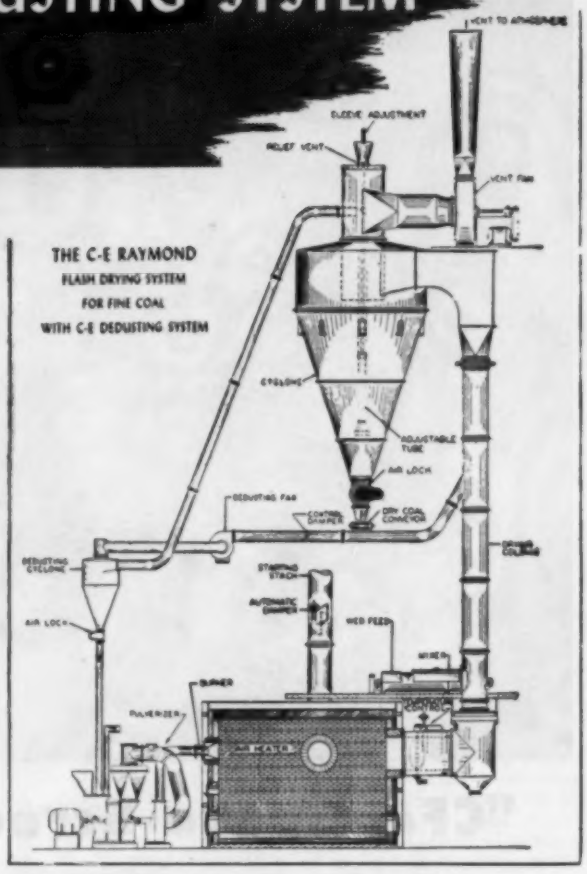
It has been shown that the vent loss from the cyclone is all minus 200-mesh material. This may be only ½ of 1% or less, yet it causes objectionable pollution in congested areas. Often this fraction is high in ash, and therefore tends to degrade the final product.

In drying the coal to the desired 3% moisture content, the tendency is to over-dry the ultra-fines, creating clouds of dust at all transfer points.

How efficiently the Dedusting Unit overcomes these difficulties is proven by tests conducted in some of the installations below. For example, the records show that where the feed averages 8.2% through 325-mesh, the finished dried coal product is only 1.3% of this nuisance material.



The C-E Raymond Dedusting Unit is available for addition to existing C-E Flash Drying Systems, and also for new equipment. Write for pamphlet.

C-E RAYMOND Coal Drying Installations

Rochester & Pittsburgh Coal Co.
Kent Mines, McIntyre, Pa. (55)*
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Luzerne County Gas & Electric Corp.
Hunlock Power Sta., Kingston, Pa. (50)
Rochester & Pittsburgh Coal Co.
Lucerne Mines, Homer City, Pa. (175)
Island Creek Coal Co., Delbarton, W. Va. (65)
Disco Company, Library, Penna. (42)
Kuesel Coal Company, Milwaukee, Wis. (15)
Eastern Gas and Fuel Associates
Wharton, Boone County, W. Va. (57)
Blue Diamond Coal Co., Leatherwood, Ky. (75)
Island Creek Coal Co., Delbarton, W. Va. (60)
Black Star Coal Corp., Alva, Ky. (60)
Hanna Coal Company, Adena, Ohio (160)
Red Jacket Coal Corp., Coal Mountain, W. Va. (40)
Clinchfield Coal Co., Dante, Va. (180)
Valley Camp Coal Co., Triadelphia, W. Va. (50)
Harmar Coal Co., Harmarville, Pa. (120)
(Formerly Consumers Mining Company)
Jamison Coal & Coke Co., Farmington, W. Va. (157)
Red Jacket Coal Corp., Red Jacket, W. Va. (70)
Eastern Gas & Fuel Associates
Wharton, Boone County, W. Va. (60)
Mitsubishi Mining Co. Ltd., Namazuda, Japan (10.7)
United States Dept. of Interior
Bureau of Mines, Morgantown, W. Va. (1.6)
Island Creek Coal Co., Mine #6 Bartley, W. Va. (120)
Pittsburgh Consolidation Coal Co.
Pipeline Project, Cleveland Electric
Illuminating Co., Eastlake, Ohio (203.2)
Consolidation Coal Company, Mine #93
Fairmont, W. Va. (200)
Jewell Ridge Coal Company
Tazewell, Virginia (68)
Bethlehem Steel Company for
Erie Mining Co., Emco, Minn. (36.5)
Carbon Fuel Co., Carbon, W. Va. (60)
Consolidation Coal Co., Jamison-Loveridge Mine,
Fairview, W. Va. (400)
Island Creek Coal Co., Mine #28,
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Omar Mining Co., Omar, W. Va. (176)
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*Estimated

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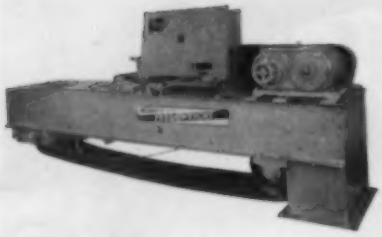

Yes-feed by weight

with the MERRICK FEEDOWEIGHT, a self-contained automatic conveyor scale, with automatic gate for feed rate control. Powered feed regulator operates gate, without restraint on scale beam. Uniformly feeds bulk material BY WEIGHT; automatically totalizes weight of materials fed. Simple to operate. Slow moving parts mean long life. Easy to install, maintain.

Manufacturers of

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PLATEGRIP
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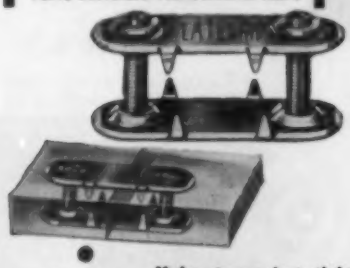
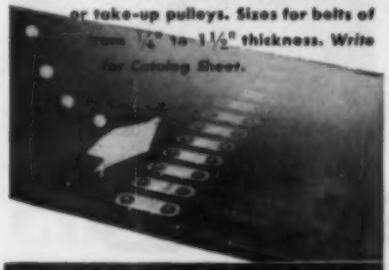


Make strong dust-tight, water-tight joints in belts of any width. Special design spreads tension uniformly across belt, allow natural troughing of belt and assures smooth operation over flat, crowned or take-up pulleys. Sizes for belts of from 1/4" to 1 1/2" thickness. Write for Catalog Sheet.



ARMSTRONG BRAT & CO.
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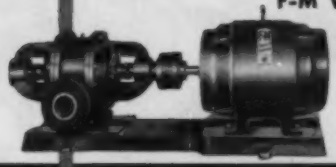
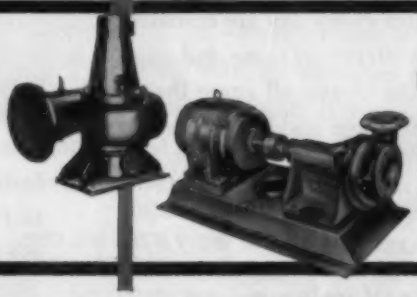
Coal Men on the Job . . .

CLINCHFIELD COAL CO., Compass No. 3 mine, Dola, W. Va.—Warren Wilson (seated, left), mine foreman; L. F. Wilson, superintendent; Lawrence Wright and G. A. Schweinbraten, section foremen. Harold Boyles (standing, left), section foreman; M. D. Knight, mine foreman; H. Boyles, section foreman; L. O. Davis, maintenance foreman, and Noah Eckard, section foreman.

CLINCHFIELD COAL CO., Compass No. 3—M. E. Kent (left), consulting engineer; Charles Findlay, chief engineer; G. L. Hall, preparation engineer; H. O. Meadows and R. O. Williams, transitmen; J. W. Post and C. G. Robinson, rodmen.

SAFETY LESSON—Lloyd G. Fitzgerald (right), mining engineer, U. S. Bureau of Mines, Mt. Hope, W. Va., uses a dust gallery to demonstrate how fine coal dust explodes and coarse particles are thrown burning along entries. The men are a few of the 280 who recently completed an accident prevention course at the No. 1 mine, Tioga Coal Corp., Tioga, W. Va. From left to right they are, Russell Cutlip, Henry Graham, Elvin Jackson, James Tyree, Thurman Chapman, Fred Bennett, Marion Miller, Harry Crites, William Dempsey, Cecil Rapp, James Phillips, Edward Canfield, E. W. Wilson, and Mr. Fitzgerald.

Guide to better pump selection

for		specify
boiler feed condensate return hot and cold liquids chemicals refrigerants, etc.	up to 200 gpm. pressures to 900 ft.	 **F-M WESTCO PERIPHERAL PUMPS** High pressure at normal operating speeds. Handle widely varying heads with little change in capacity. Sizes 1¼" through 2½".
hot and cold liquids liquid circulation nonviscous liquids boiler feed cooling towers, etc.	up to 900 gpm. pressures to 525 ft.	**F-M BUILTOGETHER CENTRIFUGAL PUMPS** General-purpose, close-coupled pump and motor units mount in any position—horizontal, vertical or angular. Sizes ¾" through 5".
sewage slurries paper stock fruit shrimp vegetables, etc.	up to 30,000 gpm. pressures to 175 ft.	**F-M NON-CLOG PUMPS** Unexcelled for clog-free handling of liquids with solids in suspension. Sizes 2" through 20". Vertical or horizontal. Bladeless or conventional.
water supply plant service booster circulating air conditioning refrigeration chemical liquids boiler feeds, etc.	up to 50,000 gpm. pressures to 700 ft.	**F-M SPLIT-CASE CENTRIFUGAL PUMPS** High, sustained efficiency over wide range of conditions. Low-cost maintenance. Sizes 1½" through 36". Single stage or multistage.
hot and cold liquids chemicals circulating liquids nonviscous liquids cooling towers condenser circulation, etc.	up to 100,000 gpm. pressures to 250 ft.	 **F-M END-SUCTION PUMPS** A wide line of rugged, precision-built pumps. Sizes ¾" through 54". Horizontal or vertical centrifugal.

FOR LOW-COST PUMPING *SPECIFY* FAIRBANKS-MORSE

Need new pumps? Your Fairbanks-Morse Dealer has the world's greatest variety for you to choose from. Need help in selection? Your F-M Dealer and F-M Sales Engineer will help specify the right type, right size pump and driver for low-cost, foolproof operation. Call them today, or write Fairbanks, Morse & Co., Dept. CA-10, 600 So. Michigan Ave., Chicago 5, Illinois.

FAIRBANKS-MORSE

a name worth remembering when you want the BEST

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • MAGNETOS

WEMCO | First Choice For Flotation

Proved in Metallic Flotation

Proved in Non-metallic Flotation

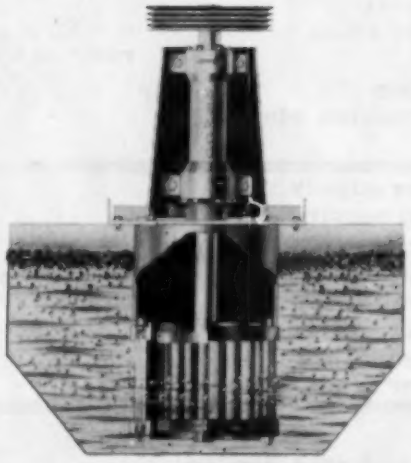
Now proved in Coal Flotation!

Treatment of fines no longer need be a problem in modern coal-washing plants, with performance-proved Wemco Flotation machines on the job.

More and more coal operators every day are discovering the many bonus benefits offered by these coal-engineered Wemco flotation units . . . and all agree there's no better way to increase tonnage and lower costs at the same time.

Check these outstanding features of Wemco Flotation Machines:

- **Larger tonnage per cell volume**
- **Lower cost per ton**
- **Simpler mechanism**
- **Lower operating costs**



Wemco Flotation machines utilize a high-intensity mixing system with proven air control features, providing optimum coal attachment to floated bubbles and maximum drop-out of ash material. The unique rotor-stator principle assures faster flotation, greater flotation recovery, and unmatched overall efficiency.

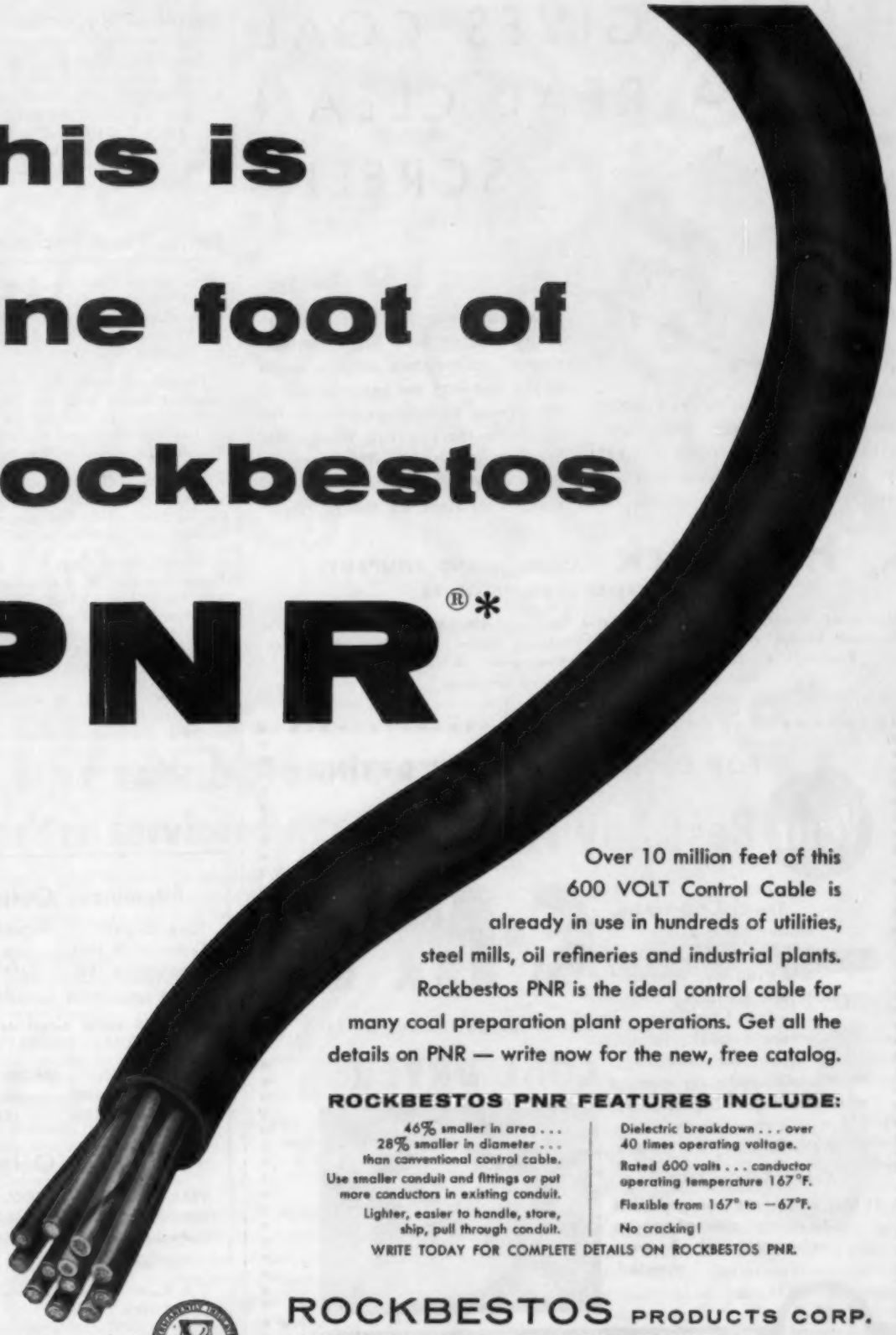
For additional information, check with your WEMCO representative or write:

WEMCO

WESTERN MACHINERY COMPANY
650 FIFTH STREET
SAN FRANCISCO 7, CALIFORNIA

Representatives in principal cities of the United States and in Canada and in major countries throughout the world.

This is One foot of Rockbestos PNR®*



Over 10 million feet of this 600 VOLT Control Cable is already in use in hundreds of utilities, steel mills, oil refineries and industrial plants. Rockbestos PNR is the ideal control cable for many coal preparation plant operations. Get all the details on PNR — write now for the new, free catalog.

ROCKBESTOS PNR FEATURES INCLUDE:

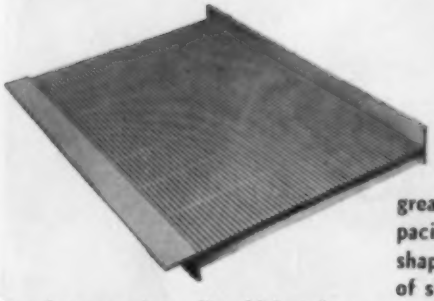
- 46% smaller in area . . . 28% smaller in diameter . . . than conventional control cable. Use smaller conduit and fittings or put more conductors in existing conduit.
- Lighter, easier to handle, store, ship, pull through conduit.
- Dielectric breakdown . . . over 40 times operating voltage.
- Rated 600 volts . . . conductor operating temperature 167°F.
- Flexible from 167° to −67°F.
- No cracking!

WRITE TODAY FOR COMPLETE DETAILS ON ROCKBESTOS PNR.

ROCKBESTOS PRODUCTS CORP.
NEW HAVEN 4, CONNECTICUT
NEW YORK • CLEVELAND • CHICAGO • PITTSBURGH • LOS ANGELES • DETROIT
ST. LOUIS • ATLANTA • DALLAS • OAKLAND • SEATTLE

*P — polyethylene, N — nylon, R — Rockhide (PVC)

GIVES COAL A REAL CLEAN SCREEN!



You keep coal quality high when you give it a Hendrick Wedge Slot screening! Hendrick Wedge Slot has the kind of small openings that assure fine screening yet affords far greater draining and screening capacity. Profile bars are "precision shaped" to maintain uniform width of slot openings the entire length of the screen as wear progresses. For details on the Hendrick Wedge Slot Screen best suited to afford long life under your specific operating conditions, write Hendrick today.

Hendrick MANUFACTURING COMPANY
41 DUNDAFF STREET, CARBONDALE, PA.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids • Hydro Dehazers • Petrochemical Column Internals

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CONTINUOUS CENTRIFUGAL
COAL DRYERS

The C.M.I. Dryer has what it takes to get coal dewatered down to 5% moisture and even less. Amazing capacity and performance . . . C.M.I. installations, wherever coal is mined, speak for themselves. Most-profit-producing method of reclaiming marketable coal from slurry. Write for complete details.

C.M.I. Service Anywhere! Our engineers are available to render prompt service whenever and wherever needed.

C·M·I Centrifugal DRYERS
CENTRIFUGAL & MECHANICAL INDUSTRIES, INC.
146 President St. • St. Louis 18, Missouri

Earnings Reported

Truax-Traer Coal Co. and subsidiaries report consolidated net income of $415,235 after federal income taxes for the first quarter of the fiscal year, ending July 31, 1957. This is 26c per share of common stock, the same as per share earnings a year ago.

Preparation Facilities

Pocahontas Fuel Co., Pocahontas, W. Va.—Contract closed with the Deister Concentrator Co., Inc. for five Concenco No. 77 diagonal deck coal washing tables for cleaning ⅜x0.

Heidelberg Sales Co., Avoca, Pa.—Contract closed with the Deister Concentrator Co., Inc. for one Concenco No. 77 Diagonal Deck coal washing table for cleaning barley size anthracite.

Kaiser Steel Co., Raton, New Mexico—Contract closed with The Jeffrey Mfg. Co. for 3-cell addition to present 2-compt. jig with 65 tph increase for 5x0.

Westmoreland Coal Co., Boone and Logan Counties, W. Va.—Contract closed with the Industrial Engineering & Construction Co., Inc. for a slope belt installation at Hampton No. 4 mine. Contract includes shaker screens which sizes the R-O-M coal into 5x0 and +5 in.

Panther Coal Co., Roseann, Va.—Contract closed with Fuel Process Co. for an M-3 heavy-media coal washer for recovery of a middlings product from 30-50 tph of 4x¼-in refuse. Completion, Nov. 15, 1957.

Bituminous Output

YEAR TO DATE	PRODUCTION
September 14, 1957	346,921,000
September 15, 1956	347,998,000

1957 output 0.3% behind 1956.

A month earlier output was 0.1% behind 1956.

WEEK ENDING	PRODUCTION
September 14, 1957	10,100,000
September 15, 1956	10,601,000

Anthracite Output

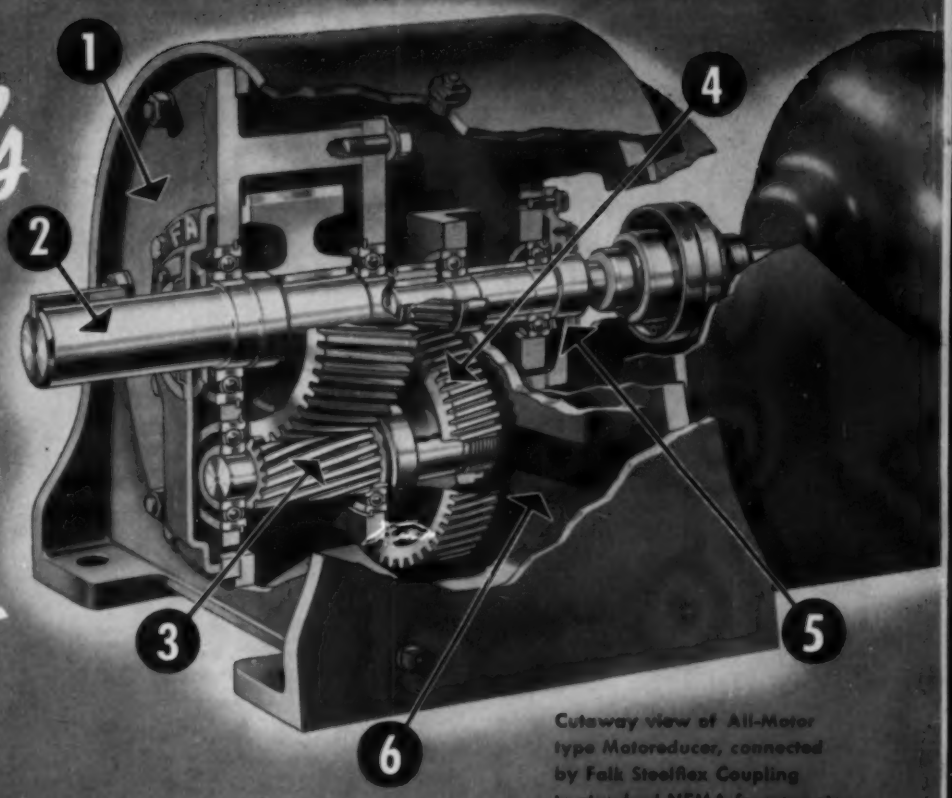
YEAR TO DATE	PRODUCTION
September 14, 1957	18,259,000
September 15, 1956	19,410,000

1957 output 5.9% behind 1956.

A month earlier 1957 was 5.5% behind 1956.

WEEK ENDING	PRODUCTION
September 14, 1957	556,000
September 15, 1956	655,000

Here's the inside story—



Cutaway view of All-Motor type Motoreducer, connected by Falk Steelflex Coupling to standard NEMA frame motor

WHY Falk Motoreducers give better service—have longer life

Here is the "inside story" behind the all-steel All-Motor type FALK Motoreducer's universal reputation as a gear drive unmatched in quality, efficiency, dependability, ease of maintenance and long life. These "In-built" factors are—

1 **ALL-STEEL HOUSINGS.** Rugged, strong, rigid...all parts are manufactured from heavy steel plate, formed and welded in the Falk Weld Shop.

2 **LARGE OVERHUNG LOAD CAPACITY.** Large shafts, oversize bearings...rigid mountings with wide bearing spans to handle maximum applied loads.

3 **PRECISION GEARING.** Heat-treated alloy steel gearing, precision cut and shaved after heat treatment to eliminate distortion. Quiet, crown-shaved pinions.

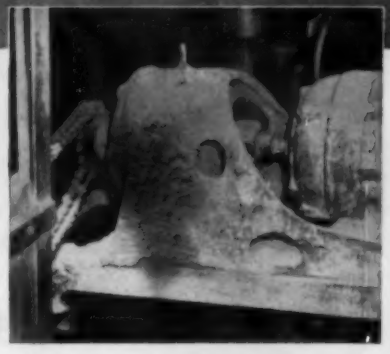
4 **EXTRA-CAPACITY GEARING.** Special extra-capacity gear-tooth form with larger contact area gives greater strength, higher load-carrying capacity.

5 **SEALED HOUSINGS.** Splashproof, dustproof, oil-tight construction. Dual closures and one-way vents keep oil in, dust and moisture out.

6 **POSITIVE LUBRICATION.** Large sump capacity...oiltight construction assures clean lubricant...revolving elements lubricated by direct dip.

When you buy or specify the All-Motor type FALK Motoreducer, you get all these—plus the tremendous advantage of full interchangeability of motors. Switch motors as desired—use any make, style or type of standard foot-mounted motor within the unit's AGMA rating—with a minimum of difficulty or "down time."

Available in sizes up to 75 hp—*with or without motor*—from convenient factory, field or distributor stocks, from coast to coast. **Write for Bulletin 3100.**



60,000 HOURS WITHOUT A FAILURE!

Sixty thousand hours is a lot of hours—but the FALK Motoreducer in the unretouched photo above has served that long without failure or need of repair.

This 3 hp unit is one of over 60 FALK Motoreducers in daily service in an Eastern plant of a large milling company, whose president says, in part:

"One of the main advantages of FALK Motoreducers is their adaptability to any motor. Reducers and motors can be easily interchanged....Our service records confirm the wisdom of our choice of FALK equipment as our standard."

FALK ...a good name in industry

THE FALK CORPORATION, MILWAUKEE, WISCONSIN

MANUFACTURERS OF

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

CARL: "A new flocculant doesn't interest me. I've been using the same one for 17 years."

FRED: "Is that so? I'm always looking for something better, Carl. That's why I tried Separan 2610."

Which is your reaction to the revolutionary flocculant, Separan 2610?

Let's listen in on a conversation between these two veteran coal processors: "I don't see why you're so resistant to change, Carl. The way I figure it, we've got to keep an open mind to improvements . . . like trying this new flocculant, Separan 2610®."

"Horsefeathers, Fred, I wouldn't go to the trouble."

"Trouble! You could hardly call it that, Carl. Think of the results! I'm using only 0.06 pound per ton of fines in my thickener. And the overhead is better than I've had in years. It's just a matter of using Separan properly."

"Properly?"

"Well sure, Carl. You wouldn't drive a car like a horse and buggy. By using Separan the right way I've upped settling speed and get better dewatering on the overflow. The best part, of course, is that the overflow solids have been reduced."

"Mighty interesting. But . . ."

"But, but, but. No buts, Carl. Even if you have used the same flocculant for 17 years, you owe it to yourself and your company to try Separan."

NOTE: Separan 2610 is truly a revolutionary flocculant that, today, promises coal processors a future of vastly speeded-up settling and filtration. A sample and technical assistance can be obtained by writing THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. SC 1319F-2.

YOU CAN DEPEND ON DOW

Here no motor can be too safe . . .

so Louis Allis Bureau of Mines permissible motors are used for lasting dependability

Nothing has been spared to give this Louis Allis Mine Type electric motor the utmost margin of safety. Special cartridge bearing construction assures long bearing life. And then there's the new research development of Louis Allis: special varnishes that afford maximum protective insulation against moisture.

They're built tough to take the physical punishment of coal mine service. Ample use of lock washers and wired bolting keeps all parts tight and in place — end bells are doubly secured by extra bolt fasteners. Every construction and design detail is engineered to match prevailing coal mine conditions.

For conveyors, cutters, pumps, fans — whatever your modernization program includes — consider this motor by Louis Allis—originator of the explosion-proof motor.

Write today for our file-sized DC Motor bulletin 1450. The Louis Allis Co., 441 E. Stewart St., Milwaukee 1, Wis.

EP-109

LOUIS ALLIS

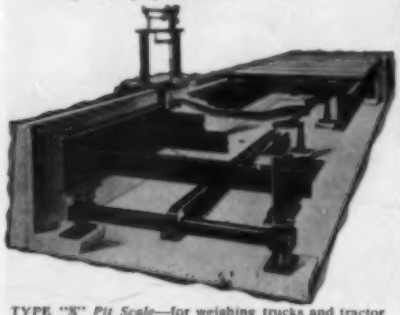
MANUFACTURER OF ELECTRIC MOTORS AND ADJUSTABLE SPEED DRIVES

WINSLOW

Dependable — Accurate

TRUCK and TRACTOR TRAILER SCALES

TYPE "C. S." *Portable Scale*—easily and quickly set up—with preparation held to minimum



TYPE "S" *Pit Scale*—for weighing trucks and tractor trailers—Platform lengths 18 ft. to 60 ft. inclusive.

WINSLOW SCALE COMPANY

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Scale Manufacturers since 1896

NOW, in a fraction of present analysis time, determine

ASH and SULFUR in COAL and COKE

New High-Temperature Method

COAL ASHING—in 10-15 minutes compared with 1-2 hours for other methods. Coal is pyrolyzed to remove volatiles, then completely oxidized. Results are in excellent agreement with usual procedures.

SULFUR ANALYSIS—in 6 minutes compared to 1-6 hours required by Eschka procedure. Coal sample is burned at extremely high temperature. Sulfur is released as SO_2, is titrated automatically with a Leco sulfur titrator.

Write for Complete Technical Data!

LABORATORY EQUIPMENT CORPORATION

8010 Hilltop Road, St. Joseph, Michigan

Among the Manufacturers

U. S. RUBBER CO. dedicated this new research center on a 99-acre tract at Wayne, N. J., Sept. 18 to start 5-yr, $120 million R&D program.

Research Center

U.S. Rubber Co. is convinced that it will be able to develop tires of such superior quality that they will give entirely safe, trouble-free performance at turnpike speeds. The ideas which go into the planning and production of such valuable equipment are born and evaluated in the building pictured above. This is just one of many research centers which are part of the company's plans to spend a minimum of $120,000,000 in order to reach its objectives in the rubber and plastics field, and to unlock the wealth of atomic energy as it applies to the industry.

Modern Bearings Plant

Link Belt Co. plans to have its new, $5 million bearing plant completed by 1958. The plant will be about 850 ft long, 400 ft in depth, and all manufacturing operations will be on one floor; it will also contain a two-story office building. It is expected that the plant, complete with the most modern equipment, will be in full production by 1959.

Expanding Facilities

Harnischfeger Co. announces the purchase of a 75-acre site at Dubuque, Iowa, on which, it plans to erect a huge plant for the manufacture of its electrical equipment. The development, which is expected to provide employment for 600 to 800 workers, may be completed in the latter part of 1958. In addition to electrical hoists and excavators, the Harnischfeger Co. manufactures welding devices, pre-fabricated houses, and other types of machinery.

Stepping Up

Marion Power Shovel Co. has made three new appointments on their engineering staff. Merle V. Lashey, with the company since 1918, has been advanced to manager of engineering. Jack F. Weis, formerly chief electrical engineer, is now assistant chief engineer and Robert W. Bergmann has stepped up from assistant chief electrical engineer to the electrical engineer's spot.

Foreign Expansion

A Mexican subsidiary of Mine Safety Appliances Co. has been formed. Mine Safety Appliances de Mexico, headed by Arch S. Abbey, will have its headquarters at Calle Azahares 47, (Colonia Santa Maria Insurgentes) Mexico City. The parent firm hopes that increased emphasis will be placed on safety by management in Mexico; also, by stocking a complete line of more than 3,600 MSA products, the company feels that better service will be available.

The Allis-Chalmers Manufacturing Co. has upped to 63 the acreage the company occupies at the Harvey, Ill., works. It commenced work on a new, $3,250,000 engineering and research laboratory. The program will provide a central engineering building as well as a proving ground for material handling equipment. Harvey Works products include gasoline, diesel, natural gas and LP gas engines; besides these, the company turns out material handling equipment, including lift trucks and industrial tractors.

Gardner-Denver Co., manufacturer of air tools for mining, announces the acquisition of 30 acres of land near Derby, Colo., that will serve as a site for expansion of its Denver division. C.H. Rieman, vice-president and general manager of the Denver division, says that present plans call for erection of a factory to house forging equipment.

Ed Smallman has been named as a tractor equipment district manager for

Ten coal-hauling trucks of USS MAN-TEN* Steel do the work of 60 at one-half the cost!

Three years ago, ten big Dart Model 50 S-BDT trucks were put into service by Sunnyhill Coal Company at their New Lexington, Ohio, workings. These ten trucks, now working a single 7¼-hour shift, replaced 30 smaller trucks which had been working two full shifts per day. The smaller trucks consisted of eighteen 25-yard end-dumps and twelve 14-yard capacity trucks.

Each of the Dart trucks has a capacity of 50 tons of raw strip-mined coal per haul. The haul is approximately 3½ miles, and each truck makes 14 to 15 trips per day.

In three years of constant service, not one of the Dart trucks has broken down. None has required repair or rebuilding in any way—and all are still in perfect condition. Each truck hauls an average 120,468 tons of coal per year, and makes an average of 3,172 trips annually. Fuel consumption, tire wear, maintenance and labor have been cut substantially.

This is another typical example of how USS MAN-TEN Steel has solved a critical weight problem. These huge trailer units are designed for maximum tire capacity, which is the weight of the unit plus a 50-ton payload. Thus, any weight decrease in the trailer would cause a proportionate payload increase.

Each Dart trailer weighs about 13 tons without tires. Constructing 75% of it from USS MAN-TEN Steel effected an over-all weight saving of 15% per trailer.

In effect, the use of USS MAN-TEN Steel has increased the payload by 15% at no sacrifice of strength and without affecting tire life and efficiency. To increase the service life of all types of heavy-duty mining equipment without increasing dead weight, investigate USS High Strength Steels — MAN-TEN, COR-TEN and TRI-TEN "E." Each has characteristics for solving individual operating problems. Before you buy new trucks, get the information on these steels by writing to United States Steel, 525 William Penn Place, Pittsburgh 30, Pa., or contact the District Office nearest you.

Here are the hauling costs per ton-mile of the old and new trucks, averaged over a three-year period:

	OLD (30 smaller trucks working two shifts)	NEW (10 Darts working one shift)
Truck Operation	4.5¢	2.1¢
Truck Maintenance	6.2¢	2.3¢
Road Maintenance	1.9¢	1.5¢
Total	12.6¢ per ton-mile	5.9¢ per ton-mile

*Trademark

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS HIGH STRENGTH STEELS
MAN-TEN • COR-TEN • TRI-TEN "E"

7-227

UNITED STATES STEEL

Manufacturers *(Continued)*

Gar Wood Industries, Inc. Smallman was formerly associated with the Columbus Equipment Co. His new headquarters will be at Gar Wood's Findlay Div. in Findlay, Ohio. Gar Wood has also announced plans for a new plant, which will be located in Exeter, Pa., and employed in the production of Gar Wood–St. Paul dump truck bodies.

Caterpillar Tractor Co. began construction of a new 500,000 sq. ft. industrial engine plant on August 14. The plant will be the first of three projects slated for future development on the land, located 12 miles north of Peoria, Ill. Other plans call for a multi-building research center and a general office.

A modern research laboratory, to be utilized in the study of clutch and clutch components, is complete and ready for use by the Twin Disc Clutch Company's Hydraulic Division, Rockford, Ill. An exciting feature of the new plant is said to be the 1,000-hp dynamometer, which delivers higher power to test units than previously possible, simplifying the collection of data never before attainable, in much less time.

Femco, Inc. has appointed John Taylor district sales manager for western Pa. the Youngstown area and industrial W. Va. The firm manufactures electronic communication and control systems for industry. Mr. Taylor, who has served the firm as a sales engineer, and as Cleveland district sales manager for the past nine years, will make his headquarters at the main office at Irwin, Pa. Also, Harry L. Murray, a former sales engineer, has been promoted to the post of district sales manager for the Ohio and southern Indiana areas.

John T. Breth has been chosen as a representative of the Connellsville Manufacturing & Mine Supply Co. The nomination is part of an expanded sales policy encouraged by the company. Connellsville Manufacturing & Mine Supply has been designing and building mining equipment for coal, metal and nonmetallic use since 1901.

Wilbur L. Kennicott is the new vice-president of Kennametal Inc. Mr. Kennicott came to the company 18 years ago, just one year after it was founded. He headed the firm's engineering activities, and pioneered new techniques in the use of tungsten carbide in the metal working industry. Another appointment made by the Kennametal Co. is that of Edgar W. Engle to the position of development engineer. Mr. Engle, presently the Chairman of the Carbide Committee of the American Society for Testing Materials, will be concerned with the development of new products in connection with the company's expansion program.

John E. Chadwick was appointed vice-president and sales manager in charge of sales, service and sales promotion with Koehring Div., Milwaukee, a manufacturing division of Koehring Co. engaged in production of excavators. Chadwick was formerly the assistant sales manager of Kwik-Mix Co., also a division of Koehring Co. Another change made in the firm was the selection of Arthur V. Cossens for the Koehring Div. assistant sales manager.

R.D. Paustian and E.H. Russ were selected for sales posts in the Wire Rope Div. of LeTourneau-Westinghouse Co. Both men carry with them records of successful sales experience. Paustian joined the firm's Sales Promotion staff in 1955 while Russ comes to the company with his current appointment. Mr. Paustian will work in the central and northeastern areas, and Mr. Russ will make his headquarters in Atlanta, Ga.

James A. Graham was chosen as manager of mining tool sales for Carmet Div., of Allegheny Ludlum Steel Co. He had eight years of mining experience with the Ebensburg Coal Co., where he served as an assistant mine foreman. Prior to his latest promotion, he was with Allegheny Ludlum Steel Co. in the Detroit Div., that specializes in tungsten carbide products.

Glenn R. Aggas was promoted to the position of sales representative for Baldwin-Lima-Hamilton Co., Construction Equipment Division, Lima, Ohio. His territory will include Pittsburgh, Pa.; Harrisburg, Pa.; and Charleston, W. Va.

William C. Denison, a pioneer in the development of hydraulic power for industry, was named vice-president of American Brake Shoe Co. Mr. Denison is also president of Brake Shoe's Denison Engineering Div., which manufactures low-tonnage hydraulic presses, pumps, motors, controls and components. The Denison Engineering Co. was organized by Mr. Denison in 1931, and was acquired by Brake Shoe in 1955.

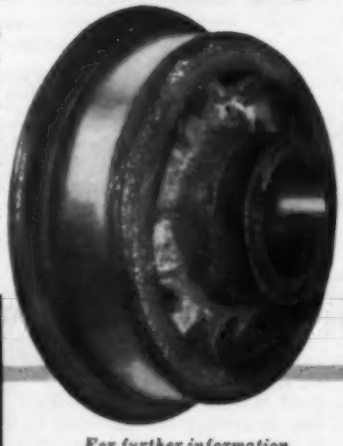
Worley R. Stout has joined the Pittsburgh district office sales staff of Clark Controller Co. He was previously with the company at its main office in Cleveland. Clark Controller Co. manufactures standard and specially-engineered electric control devices and systems.

Robert G. Allen, who has served two terms in Congress as a representative for the Pa. 28th district, has been elected to a new vice-presidency created by Bucyrus-Erie Co. The company manufactures excavators and drilling equipment. Mr. Allen was a lieutenant colonel in ordnance during the second world war. He is a native of Boston.

acf Load-support
MINE CAR WHEELS

Quick-chilling after casting gives acf Chilled Tread Car Wheels extra resistance to abrasion and wear, gives you real economy through long service life. Gray iron center costs less to mount, reduces vibration and effects of stress concentration. Curved plates support tread at load center: minimize damage to treads.

Cross Section of acf "Load Support" Mine Car Wheel showing: (1) uniform depth of hardening, (2) extra heavy overhang, (3) support at center of tread.



For further information, just ask your acf representative.

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Berwick, Pa. • Huntington, W. Va. • Plants: Berwick, Pa. • Huntington, W. Va. • St. Louis, Mo.

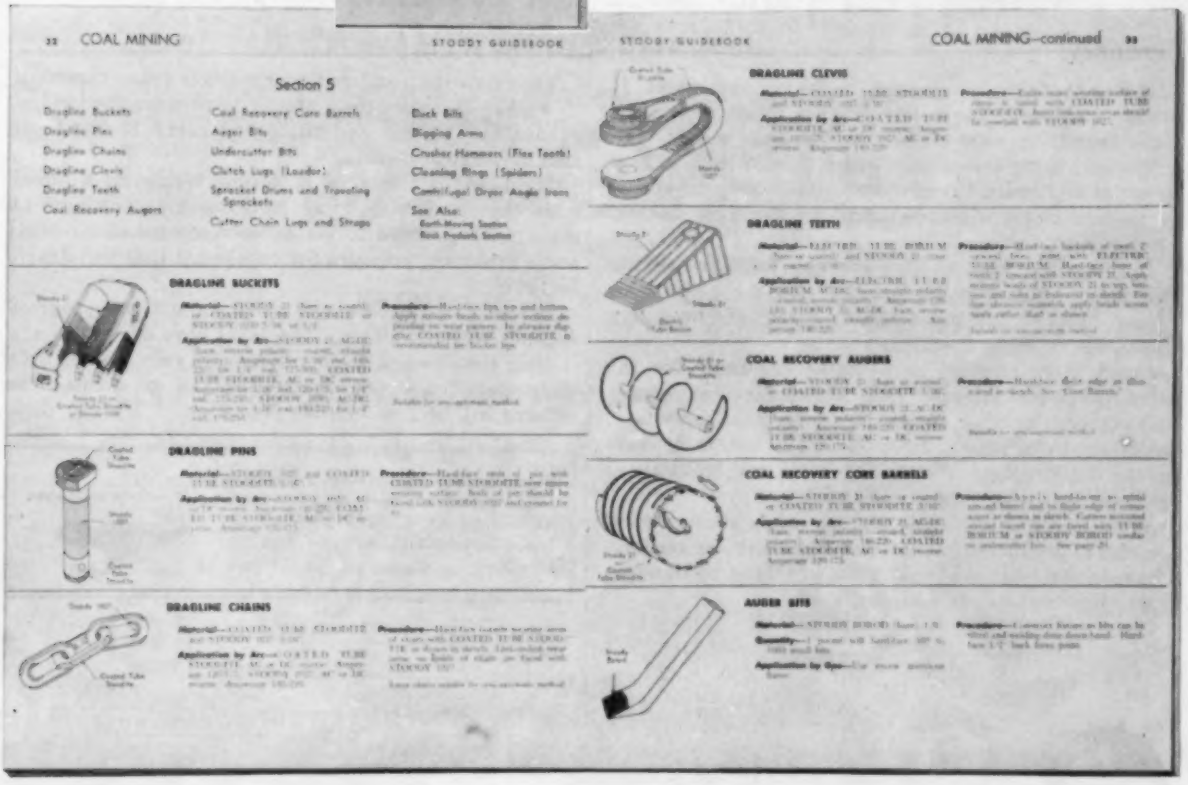
How long will COAL MINING EQUIPMENT really last?

Keeping coal mining equipment on the job despite abrasive wear isn't easy. Yet life of all wearing parts can be materially stretched when properly hard-faced. The *big trick* is in using the *right hard-facing alloy* in the *right place.*

WHICH ALLOY TO SELECT? Fortunately, most of the gamble has been taken out of hard-facing by Stoody. Exhaustive tests have been conducted on all types of equipment to determine both the best hard metal and application technique. The results of these tests are summarized in the Stoody Guidebook.

Most successful method of applying hard-facing is clearly illustrated for each piece of equipment. The best alloy or alloys are also designated and application procedures briefly described. By following these simple hard-facing directions, *you'll get a marked increase in the life of all your equipment, reduce downtime for repairs* and *make distinct savings in replacement parts!*

ASK FOR YOUR GUIDEBOOK TODAY—The new issue is just off the press! It's complete, up-to-date and waiting for you at your local Stoody Distributor (check the Yellow Pages of your phone book). Ask him for your copy or write direct to the company.



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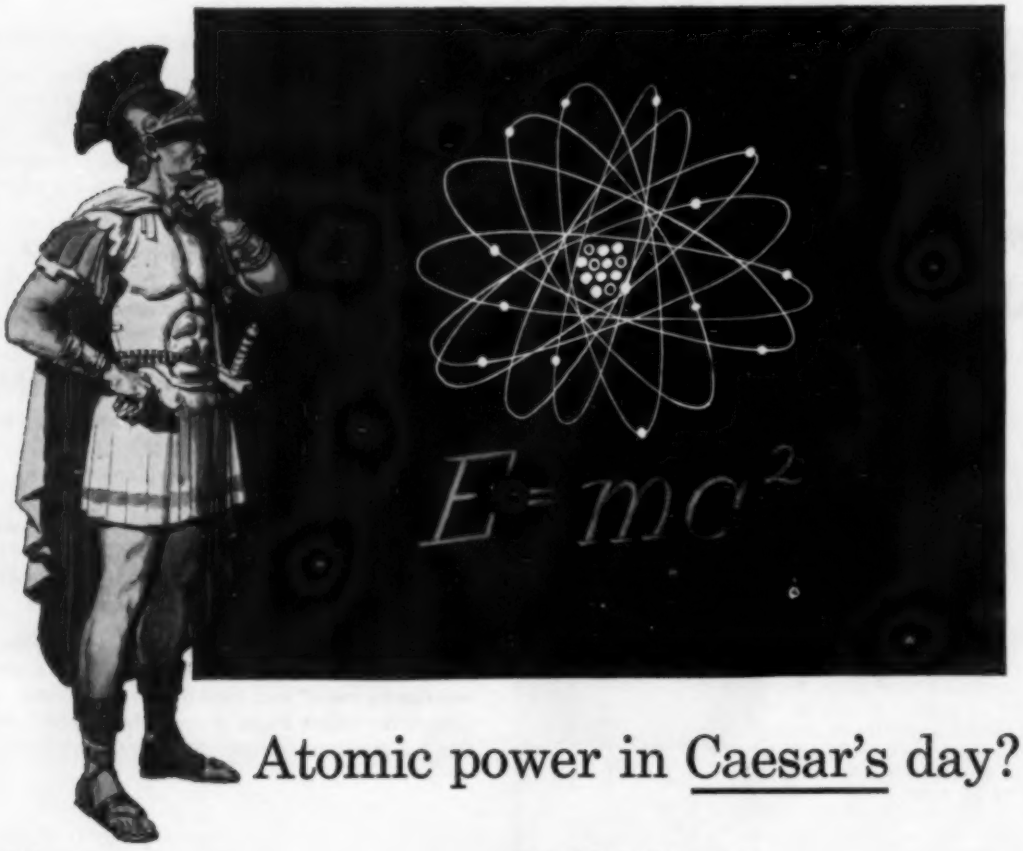

Atomic power in Caesar's day?

Certainly!

It was there, in the ground, in the air and water. It always had been. There are no more "raw materials" today than there were when Rome ruled the world.

The only thing new is knowledge . . . knowledge of how to get at and rearrange raw materials. Every invention of modern times was "available" to Rameses, Caesar, Charlemagne.

In this sense, then, we have available *today* in existing raw materials the inventions that can make our lives longer, happier, and inconceivably easier. We need only *knowledge* to bring them into reality.

Could there possibly be a better argument for the strengthening of our *sources* of knowledge—our colleges and universities? Can we possibly deny that the welfare, progress—indeed the very *fate*—of our nation depends on the quality of knowledge generated and transmitted by these institutions of higher learning?

It is almost unbelievable that a society such as ours, which has profited so vastly from an accelerated accumulation of knowledge, should allow anything to threaten the wellsprings of our learning.

Yet this is the case

The crisis that confronts our colleges today threatens to weaken seriously their ability to produce the kind of graduates who can assimilate and carry forward our rich heritage of learning.

The crisis is composed of several elements: a salary scale that is driving away from teaching the kind of mind *most qualified* to teach; overcrowded classrooms; and a mounting pressure for enrollment that will *double* by 1967.

In a very real sense our personal and national progress depends on our colleges. They *must* have our aid.

Help the colleges or universities of your choice. Help them plan for stronger faculties and expansion. The returns will be greater than you think.

If you want to know what the college crisis means to you, write for a free booklet to: HIGHER EDUCATION, Box 36, Times Square Station, New York 36, New York.

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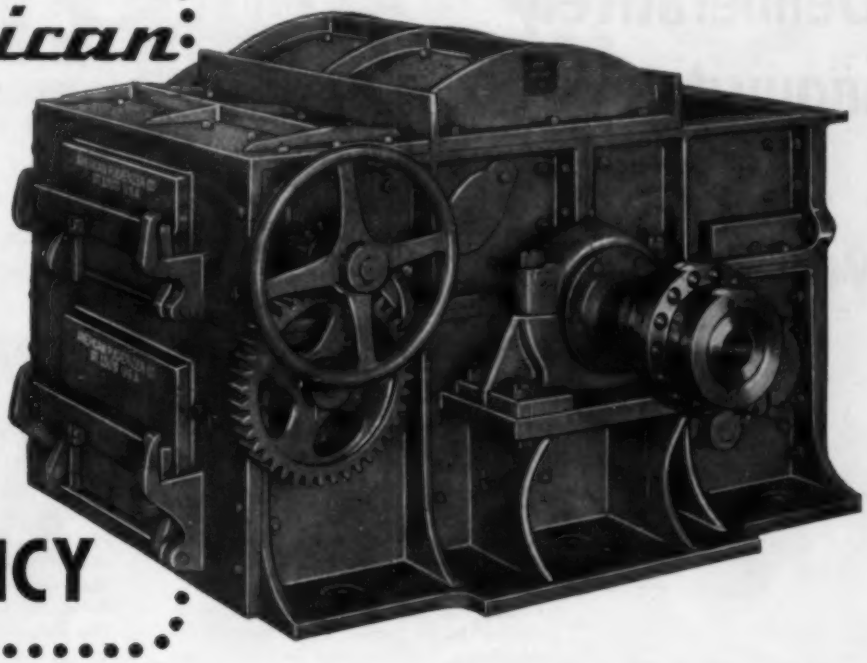

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...consistent production 10% above factory rated capacity ...at only 90% of potential motor load.

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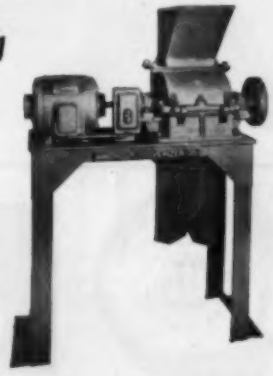
The American Sample Crusher, with its new Adjustable Sampling Hopper, gives 5%, 10%, 15%, or 20% of a sample . . . in one operation.



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So important are the facts of your satisfaction and your liking for COAL AGE—we have for many years been a member of the Audit Bureau of Circulations, a non-profit cooperative association this month celebrating its 54th year of setting circulation standards, auditing and reporting impartial circulation data. Every ABC member—over two thousand newspapers, national magazines and business publications—must conform to ABC standards. At least once a year, an ABC auditor personally examines our records and circulation books, to review the exhaustive statistical analyses we prepare.

The facts on our ABC-audited statements are widely used by buyers of advertising as an unimpeachable measure of COAL AGE's over-all value to you, the subscriber. Without advertising, which also is a highly useful service to you, the costs of producing COAL AGE would be prohibitive.

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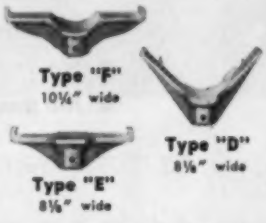

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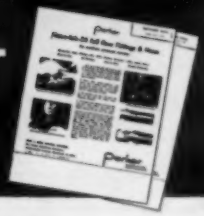

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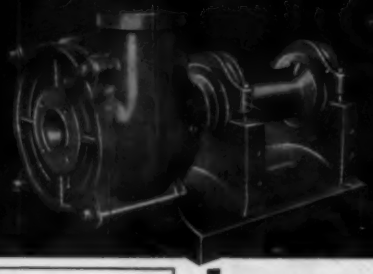

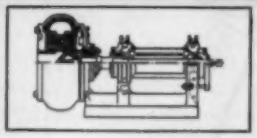

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OFFICIAL PROPOSAL

Contracts For Reclaiming and Purchasing Coal

THE COMMONWEALTH OF PENNSYLVANIA will receive sealed proposals through the Department of Property and Supplies, Room 461, Capitol Building, Harrisburg, Pennsylvania, until 9:00 a.m. EST (10:00 a.m. DST), Wednesday, October 23, 1957, which will be publicly opened and read at that time for RECLAIMING AND PURCHASING COAL AND MATERIALS CONTRACT NO. 1901 FROM KERNSVILLE IMPOUNDING BASIN AT WEST HAMBURG IN BERKS COUNTY, PENNSYLVANIA.

CONTRACT NO. 1902 FROM AUBURN IMPOUNDING BASIN AT AUBURN IN SCHUYLKILL COUNTY PENNSYLVANIA.

CONTRACT NO. 1903 FROM CROSS KEYS IMPOUNDING BASIN AT ONTELAUNEE IN BERKS COUNTY, PENSYLVANIA.

CONTRACT NO. 1904 FROM TAMAQUA IMPOUNDING BASIN AT SOUTH TAMAQUA IN SCHUYLKILL COUNTY, PENNSYLVANIA.

CONTRACT NO. 1905 FROM KERNSVILLE AND CROSS KEYS IMPOUNDING BASIN AT WEST HAMBURG AND ONTELAUNEE IN BERKS COUNTY, PENNSYLVANIA.

CONTRACT NO. 1906 FROM AUBURN AND TAMAQUA IMPOUNDING BASINS AT AUBURN AND SOUTH TAMAQUA IN SCHUYLKILL COUNTY PENNSYLVANIA.

Plans, specifications, General Conditions and proposal forms may be examined free of charge and complete sets, not exceeding two (2) copies may be secured by prospective bidders in the office of the Water and Power Resources Board, Department of Forests and Waters, Education Building, Harrisburg, Pennsylvania or in the Office of N. D. Culbertson, Board Secretary, Department of Property and Supplies, Room 461, Capitol Building, Harrisburg Pennsylvania, at Five Dollars ($5.00) per set. This charge will not be refunded. Checks or money orders shall be made payable to the Commonwealth of Pennsylvania. Each proposal must be accompanied by a proposal guarantee in the form of a certified check, bank cashier's or bank treasurer's check drawn to the order of the Commonwealth of Pennsylvania in the amount of One Thousand Dollars ($1,000).

OFFICIAL PROPOSALS

A JOINT VENTURE BID WILL NOT BE CONSIDERED AND ALL PROPOSALS MUST BE COMPLETELY FILLED IN, SIGNED, EXECUTED AND SEALED IN SPECIAL BID ENVELOPE.

Attention is called to Article No. 10 of the Business Corporation Law approved May 5, 1933, P. L. 364, requiring a foreign corporation, before doing business in this Commonwealth, to procure a Certificate of Authority to do business in Pennsylvania, from the Pennsylvania Department of State.

The COMMONWEALTH of Pennsylvania reserves the right to reject any or all bids or to accept any bid.

COMMONWEALTH OF PENNSYLVANIA
Water and Power Resources Board
COMMONWEALTH OF PENNSYLVANIA
Department of Property and Supplies
Maurice K. Goddard, Chairman and Secretary of Forests & Waters.
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33—Goodman Power Duckbills, Model 477, GI½ (W)
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7—Scraper Conveyors
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1—Allis Chalmers Vibrator
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1—Lot machine trucks for Jeffrey & Goodman (C)

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1—6 ton HM835 G. E., 25" high (W)
1—6 ton G. E., Battery—All New (W)
5—6 ton 33(4T Goodmans, 36" & 45" T.G. (C&W)
3—6 ton, 904 Westinghouse (C&W)
3—6 ton, MH100 Jeffreys, 36" T. G. (C&W)
4—6 ton, HM819 G. E., 48" T. G. (W)
1—8 ton Goodman, 36" T. G. (W)
1—13 ton Jeffrey, MH110, 42" T. G. (C)
1—10 ton West, 48" T. G. (C)
1—Lot Trucks, gears & armatures for most of these locomotives. (W)
5—6 ton HM80S G. E., 36", 42" or 44" T. G.° (W)

MINE CARS

30—36" T. G. Drop Bottoms (W)
6—42" T. G. End Dumps, 19" high (C)
223—42" T. G. End Dumps, Various Sizes (W)
23—44" T. G. Drop Bottoms, 10 ton (W)
166—44" T. G. Drop Bottoms, Various Sizes (W)
385—44" End Dumps, Various sizes & makes (W)
80—48" T. G., S. D. Drop Bottoms (W)

SUB STATIONS

1—100KW Int. Diesel Generator Set (C)
1—75KW Diesel Generator Set (W)
1—100KW G. E. Motor Generator Set (C)
1—100KW MG. Set, 220/440 Volt (C)
1—150KW West. MG Set, 1200RPM, 2200 Volt, 275 DC (W)
1—150KW West. MG Set, 2200 Volt (C)
1—150KW G. E., MG Set, 1200RPM, 2200 Volt, 275 DC (W)
1—100KW Cracker Wheeler MG Set, 2300/4000 Volt (C)
1—150KW Rotary Armature (W)
1—200KW Rotary Armature (W)

MISCELLANEOUS

1—Model 7-10-24-30 McCarthy Coal Auger, fully hydraulic, used only 1000 hours. (W)
2—1 ton Budget Boom Hoist, 220/440 Volt (W)
1—Lot Motors: 1 h.p. to 100 h.p. (W)
20,000'—4/0 Stranded & Insulated copper wire (C&W)
1000'—40#, 58# & 70# Relaying Rail (W)

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If It's In This Ad—It's On Our Yard

LOADING MACHINES FOR SALE
1—12BU-7E Joy Loading Machine, reconditioned
6—7BU Joy Loaders, 250 Volt D.C.
1—11BU Joy Loader, 250 Volt D.C.
2—12BU-9E Joy Loaders, 250 V., D.C.
3—9BU Joy Loaders, 250 V., D.C.
1—14BU-7RAE Joy Loading Machine.
1—14BU-7BE Joy Loading Machine.
3—11BU-10APE Joy Loading Machines.

SHUTTLE CARS FOR SALE
1—Jeffrey Shuttle Car, 4 wheel drive and steer, modern, rebuilt.
1—32E-9 Joy Shuttle Car, reconditioned.
2—870-10-11 Goodman Shuttle Cars, permissible cable reels, 28" high, 4-wheeldrive & steer, elevating discharge, airplane type disc brakes, latest type comp'otely modern.
1—32E15-1 Joy Shuttle Car, Ser. No. ET 4562.
2—6 SC Joy Shuttle Cars, fixed elevated discharge, disc brakes, 34" high (Matched Pair).

BELT CONVEYORS FOR SALE
2—Goodman type 99-5-AB36 Goodman Belt Conveyors, each 1200' long, driven by 20/40 H.P. Louis Allis permissible motors. Equipped with 4 ply, 42 oz. Goodyear conveyor belt.
1—Barber Greene 30" belt conveyor, 1200' long, complete with 40 H.P. permissible drive, 4 p.y. 42 oz. rubber belting.

CHAIN CONVEYORS FOR SALE
1—6I AM Jeffrey Chain Conveyor, complete with pans, chains, each 300' long, 10 & 15 H.P.
3—6I HG Jeffrey Face Conveyors, complete.

HO'STS FOR SALE
1—Brownie Hoist, Model HKM, Ser. No. 6801.
2—Brownie Hoists, Model HKL, Ser. No's.: 6858-6320.
6—5 H.P. Treadwell Hoists, 250 volts D.C.

CUTTING MACHINES FOR SALE
1—11B Joy (Sullivan) Cutting Machine, 250 V. D.C., 7½' bar, Cincinnati Chain.
10—35B Jeffrey Cutters, 250 V., D.C. 8½' cutter bars.
12—35BB Jeffrey Cutters, 250 V., D.C. 8½ cutter bars
2—512 CJ Goodman Cutters, 250 V., D.C. permissible, 9 ft. cutter bar.
14—512 DA Goodman Cutters, permissible 8½' cutter bars.
3—12 AA Standard Goodman Cutting Machines.
1—29 UR Jeffrey Cutter, 250 V., D.C. Completely rebuilt and converted to low type Lee-Norse rubber mounting. 9 ft. bar.
2—7AU Sullivan Cutter, 250 volts D.C.
1—312 AA Goodman Cutter, Ser. #1-626-132.
1—9BJ (Buddy) Sullivan Cutting Machine, Ser. No. 11682, with 8½' cuttor bar.

GENERATORS FOR SALE
1—200 KW Ridgeway Motor Generator Set, complete with switchgear and 1800 amp. I-T-E automatic Circuit Breaker, 2300 AC, 275 volts DC.
1—200 KW Ridgeway Motor Generator Set, 900 RPM, complete with manual breaker, AC and DC switchgear, 2300/4000 V., AC, 275 volts DC.
1—Diesel Power Plant, consisting of 165 H.P. Cummins Diesel Engine direct connected to 100 KW G.E. Generator. Complete with switchgear and panel board.
3—50 KW G. E. Motor Generator Sets, 2300 volts AC, 275 V., DC. Complete with switchgear.
1—50 KW Westinghouse Motor Generator Set, 2300 volts AC, 275 V., DC. Complete with switching gear.
2—150 KW Westinghouse Motor Generator Sets, 2300 Volts AC, 275 volts DC. Complete with switching gear.
1—300 KW Westinghouse Motor Generator Set, synchronous motor number 2380701, 433 KW output, 433 KVA, 2200 volts, 113 amp., 1200 RPM, input power factor & 3 phase, 60 cycle. DC generator number 2598799, 300 KW, 275 volts, 1200 RPM, 1200 amp., S.O. #3813216 compound wound. Complete with DC panel and switchgear.

RECTIFIERS FOR SALE
1—200 KW General Electric Portable 3 car Rectifier, Serial No. 5976.
2—300 KW General Electric Stationary sealed ignitron rectifiers, 2300-4000 4160 primary and 275 volts DC secondary. Complete with switching equipment and associated controls.

COAL DRILLS FOR SALE
10—CP-571 Electric Coal Drills, 230 V., DC.
25—CP-472 Electric Coal Drills, 250 V., DC.
2—CD-22 Joy Coal Drills, rubber tire mounted, self-propelled, 230 volts DC.

LOCOMOTIVES FOR SALE
1—13 Ton Jeffrey Locomotive, Ser. No. 2304, Type MH-74, 42" t.g., Ht. 38", Controlled MB-38-E.
1—10 Ton Goodman Locomotive, Ser. No. 4371, Type 32A-84-T, 250 V., 42" t.g., Ht. 34".
1—10 Ton Goodman Locomotive, Ser. No. 4191, Type 32A-94-T, 250 V., 42" t.g., Ht. 34".
1—627 LD Westinghouse Locomotive, 10 ton rated, 48" track gauge, hydraulic brakes and sander, dynamic brakes, contactor control and spring bumpers.

ROCK DUSTERS FOR SALE
1—American Mine Door Bantam type Rock Duster, Type A, 220/440 Volts AC, 18½" high.
1—American Mine Door, wheel mounted Bantam type Rock Duster, 230 V., DC, 22" high.
1—MSA Track Mounted Rock Duster, 250 V. DC, 20 H.P., high pressure. Permissible. Any gauge, 38" high.
1—MSA Track Mounted Rock Duster, 10 H.P. AC or DC. High Pressure, 30" high, any gauge.

CRUSHERS FOR SALE
1—McNally-Pittsburg, 30" x 48" double roll crusher, Serial No. 124T5323B.
1—McLanahan (Bantam Buster) sing'e roll crusher, size 24" x 48", Serial No. B-3438.
1—Scottdale Crusher, 30" x 30", double roll.
1—American Pulverizer Crusher, 24" x 18", Serial No. 3126.

AIR COMPRESSORS FOR SALE
3—Joy WK 85 Air Compressors, rubber tire mounted, self-propelled, 28½' high, model 240, maximum pressure 100 lbs.
1—Schramm 120 Cu. In., comp. with 20 HP motor.

CONVERTERS FOR SALE
1—150 KW Rotary Converter, Serial No. 1054562, with 150 KVA transformer, No. 1512723, and panel boards.

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NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

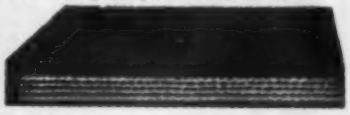
Complete Ready-Fab sections quickly and easily joined together on the job. We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2¼" or 2-7/16" diam. shaft. Belt is new 4-ply, 28-oz. duck, ⅛" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

Remember, You Save Up To 50% — Conveyor Prices Include Belting

Belt Width	Length of Conveyor	List Price	Sale Price	Belt Width	Length of Conveyor	List Price	Sale Price	Add or Deduct Per Foot
18"	25'	$1477	$ 794	18"	45'	$2217	$1166	
18"	70'	3142	1648	18"	85'	3697	1933	
18"	100'	4252	2220	18"	130'	5362	2797	$19.24
20"	25'	1517	828	20"	60'	2882	1533	
20"	75'	3467	1838	20"	90'	4052	2145	29.37
24"	25'	1590	898	24"	45'	2430	1330	
24"	70'	3480	1875	24"	100'	4740	2514	
24"	120'	5580	2950	24"	150'	6840	3603	21.78
30"	50'	2911	1617	30"	70'	3871	2119	
30"	90'	4831	2614	30"	140'	7231	3852	24.75
36"	25'	1818	1118	36"	45'	2585	1678	
36"	60'	3638	2096	36"	100'	5718	3214	27.95

NEW CONVEYOR BELTING SAVE UP TO 25%

Heavy duty 4-ply, 28 oz. duck ⅛" top rubber cover by 1/32" bottom cover 12# to 15# average friction pull; 800# to 1000# average cover tensile rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.



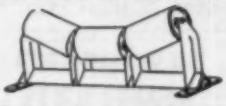
Width	Ply	List Price	Sale Price
18"	4	$4.38 foot	$3.29 foot
20"	4	4.83 foot	3.58 foot
24"	4	5.68 foot	4.26 foot
30"	4	6.97 foot	5.21 foot
36"	4	8.26 foot	6.18 foot

A high grade of heavy duty 4 and 5-ply 28 oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover, 16# to 19# average friction pull, 2500# to 3000# average cover tensile belting. For more severe service, high tonnages and abrasion resistant. For handling stone, mineral ores, concrete, cement, coal and other similar materials, both wet and dry. Belt has molded rubber edge.

Width	Ply	List Price	Sale Price
18"	4	$5.23 foot	$3.83 foot
20"	4	5.73 foot	4.37 foot
24"	4	6.74 foot	4.94 foot
30"	4	8.28 foot	6.07 foot
24"	5	7.90 foot	5.78 foot

Other widths, plies, duck weights and cover thicknesses. Available at low prices. Write for Free Sample.

NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE



3-roll, 5" diameter Troughing Idlers for:

14" belt	$18.50	24" belt	$21.25
16" belt	19.25	30" belt	22.00
18" belt	20.50	36" belt	22.75
20" belt	20.75	48" belt	25.50

1-roll, 5" diameter Return Idlers for:

14" belt	$7.25	24" belt	$ 8.50
16" belt	7.50	30" belt	9.50
18" belt	8.00	36" belt	10.00
20" belt	8.25	48" belt	11.50

All steel. Interchangeable with other well-known makes. Furnished with easily replaceable pre-lubricated Sealed ball bearings. Also can be furnished with greasable type Alemite Fitted bearings at slight additional cost. Maintenance is negligible. Write for Bulletin #1138.

BONDED CONVEYOR ACCESSORIES

Return Belt Guide Idler $11.75 — Carry Belt Guide Idler $14.50 — Holdback $99.00

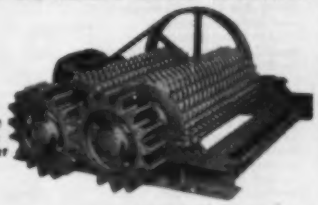
NEW BONDED® GENERAL DUTY and HEAVY DUTY VIBRATING SCREENS

For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals, including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operations, wet or dry.

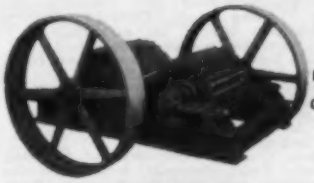
GENERAL DUTY SCREENS, TYPE A8: Eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. Write for Bulletin No. 1086. **Priced from $443.00**

HEAVY DUTY MODELS, TYPE B8: Four bearing positive throw eccentric shafts; 3' x 6' to 5' x 14', 1 to 5 decks. Write for Bulletin No. 1087. **Priced from $1,160.00**

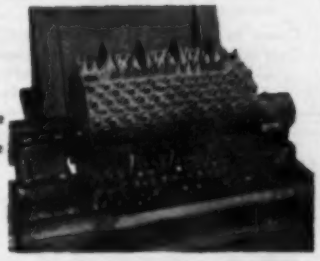
NEW BONDED® COAL CRUSHERS



Single Drive Crusher



Double Drive Crusher



Single Roll Crusher

Bonded double roll crushers are available with single and double drive, in a wide range of roll diameters and face widths. Capacities from small to 500 tons per hour. Tooth roll models are for primary and secondary crushing of coal from stoker to 8". Will take feed sizes to 24". Teeth are designed to break materials sharp and clean with accurate sizing and a minimum of fines. Bonded double drive crushers are for larger resultant sizes to 8". All models are available with fine corrugated or smooth rolls or any combination of same for crushing Cinders, Pumice, Perlite, Other Expanded Lightweight Aggregate, Chemicals, Limestone Chips, Fertilizer and many other materials.

Bonded Single Roll crushers give you a wide range of resultant sizes and reduces run of mine coal in one operation.

All Bonded crushers have heavy coil springs that act as an adjusting mechanism as well as a safety device and they are complete with steel hoppers. Write for Bulletin #1119 describing complete line of Bonded Crushers. Priced from $527.00

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For high tonnage and controlled feed of Aggregate, Sand, Gravel, Crushed Stone, Clay products, Metallic Ores, Coal, Cinders and almost any other bulk material to Crushers, Screens, Conveyors, Mills and other process machinery. All models available in abrasion resistant alloy steel plate. Capacities to 250 tons per hour. Write for Bull. #1140 & #1182.
Priced from $275.00

NEW BONDED BUCKET ELEVATORS

Open or Enclosed Vertical or Inclined Bucket Elevators with continuous or spaced buckets mounted on chain or belting. Recommended for small to medium size lumps of coal, fine abrasive material such as dry sand, coke breeze, wet slag and many other bulk materials. Because of the wide variety of sizes and types, prices will be quoted on request. Write for Bulletin #1047.

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1—G-15 Shaker Conveyor—column type pans.
2—61-AM Chain Conveyors.
1—Fairfield Conveyor.
2—Air Compressors.
4—DC Bonders, AC Welders.
1—Drag Cable Motor—rubber-tired.
1—5x7 rubber-tired Mine Car.
1—10 ton Westinghouse Locomotive.
1—8 ton Goodman Locomotive
1—5 ton Goodman Locomotive.
1—3 ton Goodman Locomotive.
1—G.E. 825 Locomotive, 26" above rail.
1—MH-96 Locomotive, 4 ton.
1—MH-88 Locomotive, 6 ton.
1—Fairbanks Morse Mine Car Scales with Streeter-Amet Recording Device.
Tipple Equipment, Main Shaker, Assorted Screens.
Feeder, Loading Booms, Conveyors, Elevator, Classifying Screens, Car Retarders.
Tipple Parts, Trolley Wire & Fittings.
1—8,000 Gallon Storage Tank (Tank car type).
1—1600 Amp. Automatic Breaker.
AC and DC Motors—Air Cooled Gas Engine.
Locomotive Tires—new and used supplies.
Treated Power Poles & Fittings.
Mine Cars 23" above rail—end dump.
Shop Equipment—chain blocks.
Complete Cleaning Plant, Menzies Separator, Sludge Tanks, Conveyors, Brown Fayro Car Retarders, Coal Silos, Car Shakeouts, Truck Scales, etc. Perfect condition.

1—G-12½ Shaker Conveyor—Size #1 Pans.
2—Face Conveyors.
2—Sullivan Hoists, 5 H.P., Rope 100 Ft. per minute.
Edison Lamps—Chargers—Electric Still.
1—Goodman 212AA Machine, DC.
2—Goodman 212AA Machine, AC.
1—Goodman 312 Machine.
1—35BB Jeffrey Machine.
1—24-B Jeffrey Machine.
1—Sullivan CR-10 Machine.
1—CE6 Sullivan Machine with Truck.
1—Phillips Cross-over Dump.
1—2x6 De-Watering Screen.
3—50KVA Transformers.
3—75KVA Transformers.
20 & 25# Switches.
Steel Ties 48" and 44" Gauge—plates and angle bars.
Complete Substations.
Coal Drills, Drill Press—Grinders—Pumps—Blowers—Fans—Jacks.
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Trucks and Pony Trucks for Goodman 212AA and Standard Machines.
Extra Armatures—Locomotive Trucks.
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42", 44", and 48" Gauge End Dump Mine Cars.

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1—24" x 24" Jeffrey Single Roll
1—18" x 18" Jeffrey Single Roll

COAL CUTTERS
5—Goodman type 112 shortwall, A.C.
1—Sullivan type 7B super-shortwall, A.C.
3—Sullivan type 7B super-shortwall, D.C.
6—Sullivan type CE-7, A.C.
1—Jeffrey type 28-A, A.C.

SHAKER CONVEYORS
7—Goodman type G-20
6—Goodman type G-15
1—Joy type UN-17
4—Vulcan type 25/30

BATTERY LOCOMOTIVES
1—1½ ton General Electric Trammer, 18" gauge
1—1½ ton Atlas Trammer, 18" gauge
1—1½-2 ton Mancha Trammer, 18" gauge
3—3½-4 ton Mancha, 24" ga.
1—4 ton Westinghouse, 24" ga.
1—4 ton Ironton 36" ga.
2—6 ton General Electric 36" ga.
2—7 ton General Electric, 36" ga.
1—7 ton Atlas—36" ga.
3—8 ton Ironton, 36" ga.
2—8 ton General Electric, 36" ga.
2—8 ton Goodman, 36" ga.
4—10 ton Atlas, 36" ga.

TROLLEY LOCOMOTIVES
1—2 ton Atlas, 18" gauge
1—4 ton General Electric, 18" gauge
2—6 ton Jeffrey, 18" gauge
1—6 ton Goodman, 18" gauge
2—10 T. Jeiray 42" ga.
1—13 T. Goodman, 42" ga.
1—13 Jeffrey, 42" ga.
1—15 T. Jeffrey, 42" ga.

SHUTTLE CARS
1—Joy model 6003P, battery operated
7—Joy model 6001, battery operated

MINE FANS
1—120" Joy La-Del axial flow fan, model L-24
1—7' Jeffrey aerodyne 2 stage fan

HOISTS
2—125-250 H.P. Ottumwa Single Drum
1—250 H.P. Ottumwa Single Drum and many other hoists in stock, single and double drum, 10 H.P. to 250 H.P.

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6X6 ARMY TRUCKS

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HP	MAKE	TYPE	SPEED
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125	West. Open B.B.	CS-761C	1800
100	Howell Open B.B.	NC-684	900

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1—Marion 40A Dragline, #8513, 80' Boom 3 yd bucket
1—P&H 955 Dragline, #7941, 80' Boom 3 yd bucket
1—P&H 655B Shovel, #11576, 1½ yd bucket
1—D-8 Angle Dozer
1—D-7 Dozer
Spare parts for above at reduced prices

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THE IRONTON ENGINE COMPANY
FARMINGDALE, NEW JERSEY
(Formerly Ironton, Ohio. 1902-1955)

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CRANES—EUCLIDS

7400 Marion Dragline, 160', 13 yard
625 Page Diesel Drag, 150', 10 yard
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7-W Monighan Elec. Drag, 120', 7 yd.
618 Page Diesel Drag, 120', 5 yd.
5-W Bucyrus Monighan Drag, 120', 5 yd.
2400 Lima Dragline, 130', 5 yd.
111-M Marion Diesel Drag, 100', 4 yd.
1055 P&H Dragline, 80', 3½ yd.
1201 Lima Dragline, 85', 3 yd.
1201 Lima Comb. Shovel & Crane
955 P&H Dragline, 90', 2½ yd.
54-B Bucyrus Erie Drag, 85', 2½ yd.
3500 Manitowoc Drag, 85', 2½ yd.
40-A Marion Drag, 90', 2½ yd.
2000-B Manitowoc Cranes
604 & 802 Lima Cranes
151-M Marion Elec. 5 yd. Shovel
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1601 Lima 4 yd. Standard Shovel
120-B Bucyrus Erie 4 yd. Electric Shovel
1201 Lima Standard 3½ yd. Shovel
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1201 Lima 2½ yd. H. L. Shovel
955 P&H 2½ yd. Standard Shovel
802 Lima Comb. H. L. Shovel & Drag
54-B Bucyrus Erie 2½ yard H. L. Shovel
51-B Bucyrus Erie 2 yd. Shovel
Unit 1020 ¾ yard Shovel
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58-BH Joy Champion Rotary Air Drills
McCarthy Coal Auger Drill
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1—G. E. 8 ton, type 822 Locomotive, 44" ga.
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2—Goodman type 33, 6 ton, 44" and 48" ga.
3—Goodman 8 ton, type 32A, 36", 44" and 48" ga.
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2—Westinghouse, type 904, 6 ton, 44" and 48" ga.
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1—Baby Goodman 212, rebuilt, 250 volt DC.
1—Baby Goodman, 212, rebuilt, 220 v., 3 ph. AC.
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1—Jeffrey 29L on track, perfect.
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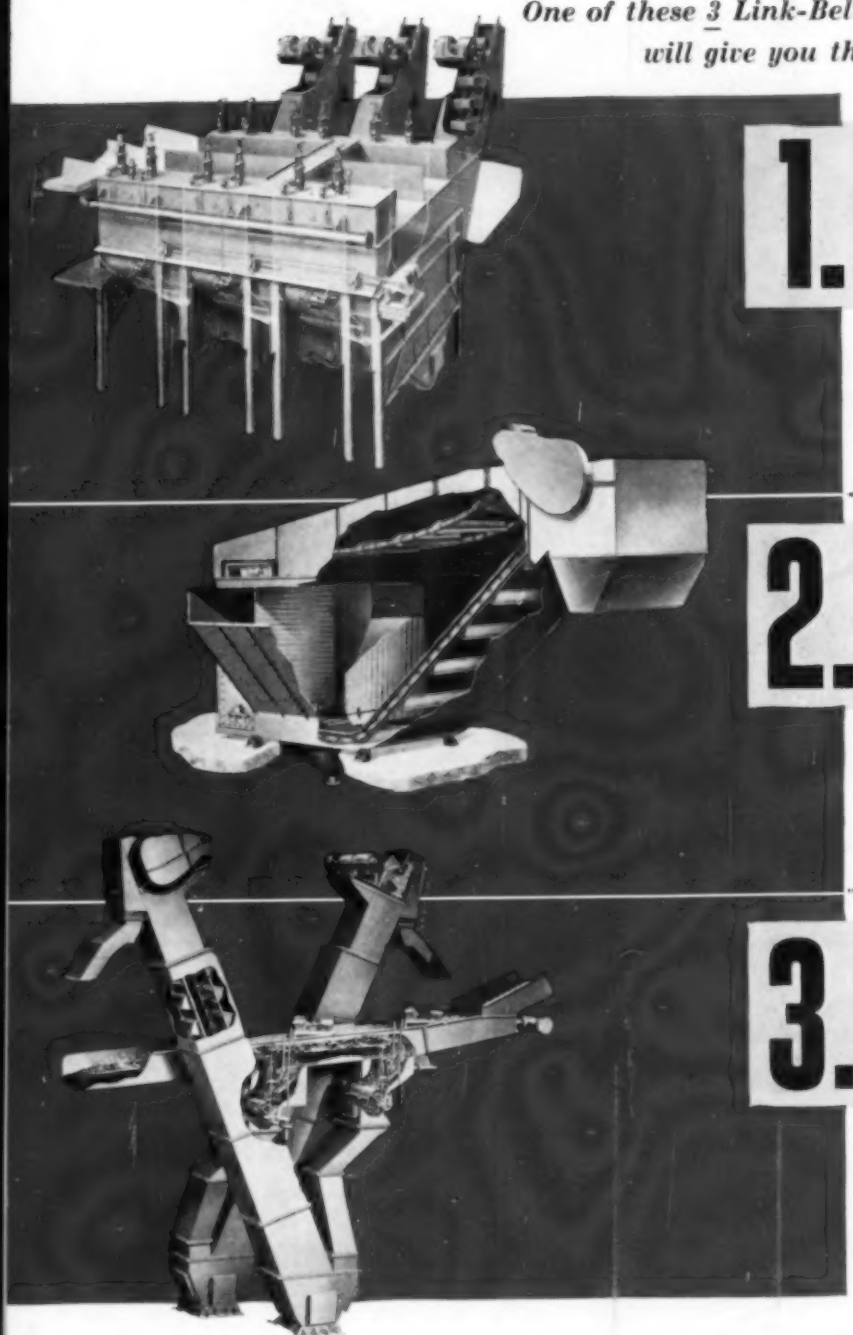

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